MILLER'S

"BOSS"

PAINTERS

GUIDE.

FOR

The Practical Painter.

Miller, R. C.

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"BOSS" PAINTERS' GUIDE.

SIXTH AND REVISED EDITION.

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A Treatise Upon the Home Manufacture of Paints, Oils, Varnishes, Dryers, &c. Instructions in All Branches of House, Sign and Carriage Painting, Paper Hanging, &c.

FOR THE PRACTICAL PAINTER.

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Preface.

The following pages prepared by the author have been carefully revised, and with the experience which we have had with the five previous editions, we are now satisfied that our effort will meet with the approval of the Practical Painter. We are not vain enough to say that we know it all, and that this little book is perfect, but we do know it has a vast amount of very valuable practical information between its covers, and we dedicate our humble effort to the craft hoping that it may have in the end a tendency towards the elevation of our noble calling.

THE BOSS PAINTERS' GUIDE.

THE HARMONY AND DISCORD OF COLORS.

Very many, calling themselves decorative artists, ignore the laws of nature, which control in the matter of harmony and contrast. Practically, they act upon the theory that colors may be arranged in a scheme, with a view to answer the caprice of the artist or his patron. He goes on arranging colors in his own work upon the theory or supposition that a certain tint or shade will look well on a given feature or part of his work, without reference to its collocation in regard to other colors. On the contrary, harmony or discord in color depend not on the will or caprice or personal taste of any one, but is based on certain unchangeable laws. These are a matter of study and experience. By these terms, harmony and discord, we understand, colors placed side by side, will alter the effect of each other, or completing one another will heighten the effect of each. Persons familiar with this subject can by so arranging colors or objects of familiar use, with reference to color, in furnishing or fitting up apartments, in dressing, or decorating walls, as to produce, even with the greatest simplicity, a more agreeable effect than is possible

with the most extravagant expenditure without a sense of harmony and discord. The art of determining by the eye alone, which are the colors giving pleasing effects when placed in combination and contrast, or those which do not, is a gift which comparatively few persons possess. Painters who have this gift or talent are usually successful in their craft; for by means of it they are not only able to please their patrons by, or through the artistic beauty of their work, but are successful for the additional reason that they do not have to resort to "Paint and try methods," in mixing and contrasting colors or shades, saving to themselves, thereby, in both time and material, and enabling them to do work under just so much of an advantage.

Knowledge is power in this case, and you will find that it is a money saving one at that.

In order to aid those who do not possess this gift, it may be proper to say that scientific observers have formulated a system by means of which pleasing combinations and the best results can surely be had, without doubt, and the unpleasant, as well as unprofitably bad arrangement of colors be avoided.

In order that an intelligent and practical idea of this all-important subject may be arrived at, the following selections upon the subject of Harmony, also Discord has been added to this book with the hope that it will satisfy the painter in as practical way as our limited space will allow without entering into a discussion upon the merits or demerits of conflicting theories.

THE PRINCIPLE OF HARMONY.

THE RAINBOW OR SOLAR SPECTRUM is probably the prettiest arrangement of color in nature. It is the foundation on which has been built the theory of color harmony. The rainbow is simply light analyzed into its elements, that is, its colors. Newton taught that these elements or colors were seven, viz: *Violet*, *Indigo*, *Blue*, *Green*, *Yellow*, *Orange* and *Red*. Later observers have, however, narrowed these elements down to three, *Red*, *Blue* and *Yellow*. These three then are the *only essential colors* because having these, all other colors can be made from them.

PRIMARY COLORS are the pure elemental colors, *blue*, *red*, *yellow*.

SECONDARY COLORS result from combining equal parts of any two primaries, as *orange*, *green*.

TERTIARY COLORS result from combining two secondaries, as *russet* or *citrine*.

In the rainbow we see the three primary colors all at once, or simultaneously, partly pure, partly in contrast and combination, hence the law: That a full harmony of contrast requires the presence of *yellow*, *red* and *blue*, in prismatic proportions, namely: of yellow, 3; of red, 5; and of blue, 8 parts respectively, i. e. parts of surface or depth of color, and not of weight of material. It is in conformity with this law that *blue* looks pretty with *orange*, a fact which the gentler sex very well knows, and their judgment is worth much in this matter. *Orange* is a secondary color, being composed of red and yellow,

Both of these colors the eye detects in its composition and instinctively calls up blue to combine or contrast with them.

This color, when furnished completes the harmony because the three primary colors are present and visible to the eye, although two of them (red and yellow) are in combination (in the orange) and only one (blue) is pure. It is blue therefore, which is complimentary to orange.

In like manner *red* and *green* form an agreeable contrast, and for the same reason, viz: two of the primaries are in the *green* (blue and yellow) the only primary lacking of the three is *red*, therefore *red* is a complimentary color to green.

VIOLET AND YELLOW are complimentary for the same reason, because the eye detects the presence of red in violet, and requires yellow to contrast or combine with them.

A complimentary color may now be defined to mean *any color which*, *when* placed in *combination or contrast with another color*, *fills or completes the natural harmony with that color.*

THE NATURAL HARMONY being understood to be the harmony resulting from a *simultaneous view* of the *three essential* or primary colors of the solar spectrum, blue, red and yellow. This simultaneous view comprehends the viewing of either colors in their pure state when in juxtaposition, as blue with red or yellow, or when any two of them are mixed, and the resultant color (a secondary) is placed in combina-

tion with the remaining third primary, as orange and blue, green and red, or violet and yellow.

Every color, hue, tint or shade has its own compliment, and the law which is applicable to one is applicable to all.

HUES are modifications of color by other colors.

TINTS are produced by adding white to colors or hues.

SHADES are produced in like manner by adding black.

TONES signify colors or hues mixed with varying ing proportions of either white or black. *White* weakens or reduces the tone. *Black* dulls them.

COMPLIMENTARY COLORS not only furnish the greatest contrasts, but they mutually help and strengthen each other.

NON-COMPLIMENTARY colors when in juxtaposition, either mutually help each other, or, one is improved while the other is injured; or, they mutually injure each other. An example of the first class is found in yellow and blue. Of the second case, in blue and bluish-violet, and of the third case in blue and violet.

WHITE AND BLACK are complimentary.

In order to further assist in this direction we refer you to the following which will give a more definite idea of the general effect, as seen through the spectrum.

DISCORD OF COLORS

1. Two simple colors.—RED AND YELLOW. Red

appears darker purple, because the indigo rays are imparted to it from the yellow; yellow appears greenish, because green rays are imparted to it from the red.

YELLOW AND BLUE.—Yellow takes away the orange rays from the blue and appears reddish; blue absorbs the indigo rays from the yellow and appears darker.

BLUE AND RED.—Blue appears greenish from the effect of the green rays of the red; red, on the contrary, from the orange rays of the blue, appears yellowish.

2. A compound color and a primary color, the latter being contained in the former:—

RED AND ORANGE.—Red absorbs the blue rays from the orange and appears blueish violet; orange is influenced by the green rays of the red, and appears yellowish, i. e. lighter.

RED AND VIOLET.—Red beside violet appears yellower, because it receives the yellow rays from the latter; violet appears darker because greenish rays are absorbed by it.

ORANGE AND YELLOW.—Orange loses from its yellow and appears redder; the yellow appears more greenish.

GREEN AND YELLOW.—Green loses its yellow and appears darker, more blue; the yellow is influenced by the reddish rays of the green and appears reddish, i. e. orange.

GREEN AND BLUE.—The green appears lighter, more yellow, as if it were faded; the blue appears reddish alongside of the blue, i. e. like violet.

VIOLET AND BLUE.—The violet loses its blue and assumes a reddish appearance in comparison with the blue, i. e. greenish.

3. Two compound colors which have one primary color in common.

ORANGE AND GREEN.—Both colors contain rays of yellow, and each loses some of tint by contact, the orange appearing more red, and green more blue.

GREEN AND VIOLET.—Both of these colors have blue in common, and hence by contact each loses its appearance, the green becoming more blue and the violet more red.

VIOLET AND ORANGE.—These two colors have the red rays in common, which are lessened by contact, the violet becoming more blue, while the orange appears more yellowish.

PHENOMENA OF GRADUAL CONTRAST.

It has been stated in our remarks on the harmony and discord of colors that red reflects green rays, and the green reflects the red rays; that all colors have their compleiing or complementary shades, which may be observed by the eye. This statement will be confirmed in the following: If one fixes his eyes for some time on a red object, and then quickly looks away or closes the eye, it appears just as if the same object appeared before him in green. Similarly, a green object, when stared at, produces a red effect when the eye looks away. When one looks at

a blue object for some time there is produced in the eye the sensation as if one saw an orange object, and, contrawise, an orange-colored object appears as if it were blue.

When these colors are seen singly, as for instance, in the form of flowers, or some other ornamentation on a light-gray back-ground, and closely watched for some time, it will be found that after a while the gray ground will appear slightly tinged by the complementary color. In the same way with —

Red, the gray ground is tinged greenish.
Green, the gray ground is tinged reddish.
Blue, the gray ground is tinged orange.
Orange, the gray ground is tinged bluish.
Violet, the gray ground is tinged yellowish.

With wall-papers and woven fabrics these facts have been noticed, and have even led to serious disputes. Thus, for instance, at Paris, in a factory of wall-papers, a case occurred in which a color mixer was found fault with for having used a greenish gray instead of an ash gray as a back-ground for a pattern of red flowers and garlands. His justification however, was at hand, in the shape of a remnant of the gray pigment, which, when examined by itself, was in reality of an ash gray tint. It was Chevereul, the distinguished chemist and director of the Gobelin Manufactory of Paris, who related the previous case, and the difficulty was settled by his showing that the red flowers imparted the greenish tint to the gray ground.

COMPOUNDING OF COLORS.

It would be an endless task to enumerate all the colors formed by the mixture of the various pigments. I will, therefore, give the simplest method of making the various tints, leaving the painter to exercise his judgment in regard to other tints not mentioned. Every painter knows that it would be foolish to attempt to give the exact proportion of the various colors, hence, I will not attempt it, but will submit the following receipts for mixing, which will serve as a good general guide at least, for it is impossible to lay out arbitrary rules owing to the variation in the strength of pigments; and, therefore, it will be necessary for the student to practice or experiment with his mixing, taking the receipt here given as a base or starting point.

FOR SIGN DECORATIVE AND CARRIAGE PAINTING.

BISMARCK BROWN.—Three parts of burnt sienna, two parts chrome yellow, and one part rose lake.

BOTTLE GREEN.—Dutch pink and Prussian blue for ground, then glaze with yellow lake.

BROWN.—Three parts red, two black and one yellow.

BRONZE GREEN.—Five parts chrome green, one of black and one of umber.

BRICK COLOR.—Two parts of yellow ochre, one of red, and one of white.

CANARY COLOR.—Five parts white, two parts lemon yellow.

CLAY DRAB.—Equal parts of raw sienna, raw umber, and white lead; tint with chrome green.

CHOCOLATE COLOR.—Five parts of burnt umber, one part of carmine or lake.

COPPER COLOR.—One part vermilion, two of yellow and one of black.

CHESTNUT COLOR.—Two parts of red, one of black and two of chrome yellow.

CITRON.—Three parts of red, two of yellow and one of blue.

CREAM COLOR.—Five parts of white, two of yellow and one of red.

CLARET COLOR.—Two parts carmine, and one of ultramarine.

CARNATION RED.—Three parts carmine lake, and one of white.

COACHING RED.—Light English Vermilion without glazing.

CHAMOLINE.—One part lemon yellow, three parts raw sienna and five parts of white.

DEEP BUFF.—Five parts yellow ochre, two parts white, one part red.

DRAB COLOR.—Nine parts of white and one of umber.

DOVE COLOR.—Equal parts of red, white, blue and yellow.

FRENCH RED.—Indian red lightened with vermilion and glaze with carmine.

FAWN COLOR,—Eight parts of white, three of red and three of chrome yellow.

FLESH COLOR —Eight parts of white, three of red and three of chrome yellow.

GOLD COLOR.—White and raw sienna, tinted.

GREEN.—Blue and yellow or black and yellow.

GRASS GREEN.—Three parts yellow and one of Prussian blue.

JONQUIL YELLOW.—Mix flake white and chrome yellow, and add a little vermilion or carmine.

LEAD COLOR.—Eight parts of white, one of blue, and one of black.

LIGHT BUFF.—Yellow ochre lightened with white.

LEMON COLOR.—Five parts lemon yellow and two of white.

LILAC.—Four parts red, three of white and one of blue.

LONDON SMOKE.—Two parts umber, one of white and one of red.

LIGHT GREY.—Nine parts white, one of blue and one of black.

MAROON COLOR.—Three parts of carmine and two of yellow.

OLIVE YELLOW.—Three parts of burnt umber and one of lemon yellow.

OAK COLOR.—Eight parts of white and one of yellow ochre.

OLIVE COLOR.—Eight parts of yellow, one of blue, one of black and one of red.

PEARL COLOR.—Five parts white, two of red and one of black.

PEA GREEN.—Five parts of white and one of chrome green.

PURPLE.—Four parts of red, three of white and two of blue.

PEACH BLOSSOM.—Eight parts of white, one of red, one of blue and one of yellow.

PORTLAND STONE.—Three parts raw umber, three of yellow ochre and one of white.

PLUM COLOR.—Two parts of white, one of blue and one of red.

QUAKER GREEN.—Three parts of chrome green, one part of black, one part of red and one of yellow.

ROSE COLOR.—Five parts of white and two of carmine.

SNUFF COLOR.—Four parts of yellow, and two of Vandyke brown.

SALMON COLOR.—Five parts of white, one of yellow, one of umber and one of red.

STRAW COLOR.—Five parts of white, two of yellow and one of burnt umber.

TAN COLOR.—Five parts of burnt sienna, two of raw umber.

STONE COLOR.—Five parts of white, two of yellow and one of burnt umber.

TEA COLOR.—Raw umber, blue and chrome green, mix to suit the desired shade.

VIOLET.—Red, white and blue to suit.

YELLOW LAKE.—Equal parts of umber and white, add a small quantity of yellow, and tint with lake.

FOR HOUSE WORK.

ASHES OF ROSES.—White tinted with lead color and lake.

BRILLIANT GREEN.—Add emerald green to white lead.

BRIGHT GREEN.—Add Paris green to white lead.

BUFF.—Add yellow ochre to white lead.

BROWN.—Add red to black.

CHESTNUT.—Add white to brown.

CHOCOLATE.—Add yellow to brown.

CREAM.—White tinted with red and yellow.

DRAB.—Add umber to white lead.

DARK GREEN.—Add black to chrome yellow.

FLESH.—Add carmine to straw.

FRENCH WHITE.—White tinted with purple.

FRENCH GRAY.—White tinted with black and purple.

LEAD COLOR.—Add lamp-black to white lead.

MAROON.—Yellow ochre, red and white.

ORANGE.—Add vermilion to chrome yellow.

OLIVE.—Add chrome yellow, blue, black and red.

PURPLE.—Add red to light blue.

PEARL.—Add blue to lead color.

PEARL WHITE.—White tinted with blue and purple.

PEA GREEN.—Add chrome green to white lead.

PEACH BLOSSOM.—Venetian red and white.

RUSSET.—Yellow ochre and Venetian red.

ROSE OR PINK.—Add carmine or lake to white lead.

STRAW.—Add chrome yellow to white lead.

SILVER GRAY.—Add lamp-black and indigo to white lead.

SALMON.—Add red, umber and yellow, to white lead.

STONE.—Venetian red, lamp-black, chrome yellow and white.

STONE, [For Inside Work,]—Umber, black, red and white.

STONE, [For Rough Work.]—Yellow ochre, brown, black and white.

DURABLE COLORS FOR OUTSIDE WORK.

Venetian Red,	Indian Red,
Chrome Green,	Roman Ochre,
Chrome Yellow,	Yellow Ochre,
Prussian Blue,	Oxide of Iron,
Antwerp Blue,	Spanish Brown,
Intense Blue,	Ivory Black,
	Lamp-black.

Do not use for outside work, umber or sienna as they are transparent colors and will soon loose their brilliancy.

If I were asked what colors or kinds of paints are best for exterior work, I would say in all cases use such colors as can be made from mineral or earth paints, with as little white lead or zinc as possible. We know that ochres, Venetian red, metalics, and even whiting, will hold to the oil, or the oil will hold to them longer than either lead or zinc when exposed. These, therefore, must be more durable for outside work.

WHITE LEAD AND ZINC.

The carbonate of lead is the purest form of manufactured white lead known to the trade, and it is therefore used by all painters where great body or

covering quality is desired. This form of lead, when ground pure in linseed oil, is not permanent, it eventually succumbs to the action of solar heat. It would last much longer if painters were to use a *coarse grade* which would admit the oil to surround the particles, thus affording a clinch or bind for the oil, when the duration of both oil and lead would be extended. It is a great mistake to suppose that because acetic acid is used in corroding lead that it remains to act upon other substances, for the simple fact of its union with the oxide of lead is lost in the carbonates of white lead, and when levigated and ground it is pure carbonate and not an acetate of lead. The grinding of white lead to a fine impalpable powder has a great deal to do with its stability when compounded with oil and exposed to the weather. It will last longer when stained or colored with earthy mixtures, but when applied as a white paint to surfaces of sunny exposure, it will chalk in two or three years. At this stage its decay is rapid, and if not recoated it will soon be blown or washed away. The causes which tend to the rapid decay of the carbonate of lead and oil is solely due to the constituent gases of which they are composed. The oil is composed of carbon, hydrogen and oxygen, and when applied as above in thin coatings on exteriors of buildings the oil in drying absorbs oxygen from the air, and the white compound becomes hard and firm to the touch. The affinity of the oxygen in the oil to that in the air is fatal to the solidity of the mixture or paint, though the oil by it becomes a

solid. The action is not like that of the volatile oils, but instead it absorbs or takes from the atmosphere large volumes of oxygen, and by it disengages the carbon and hydrogen, leaving a disintegrated mass of lead and resin. This tendency of seed oils is further demonstrated by the spontaneous combustion of various substances when besmeared with these oils. Therefore, if there is no other protector present, pure white lead is sure to be left to the mercy of the elements. The use of raw or boiled linseed oil as the vehicle to bind the lead, makes but very little difference in the lasting qualities, but the harder the oil dries the more durable the lead will be. The process of oxidizeing the lead cannot be improved to any extent or advantage to the painter and as to corroders, the mode now used is about the same as the old Dutch process. Climatic influences increase or lessen the durability of white lead, depending upon their nature. In semi-tropical countries the oil disintegrates so rapidly that white lead paint will not be serviceable more than half the time that prevails in a more temperate zone. The hardness of oxide of zinc has induced many painters, as well as some manufacturers, to incorporate the zinc with lead, in order to have an article which will increase the durability of the carbonate of lead. There is yet no formula by which the proportions can be relied on, for some think a mixture compounded with one-half zinc, and others that a one-third proportion would be sufficient to harden without affecting the body of the lead. In this latter view we are

inclined to admit it as a corrective in sunny exposures. In such cases a small proportion of *blanc de zinc*, thoroughly stirred into a mixture of pure white lead will, no doubt, change the nature of its chemistry sufficiently to give to the compound a more lasting effect.

HOUSE PAINTING.

RULES OF PAINTING.

The following general rules in painting may be followed with advantage:

1. Let the ground of your work be properly cleaned, prepared and dry.
2. See that your colors are equally well ground and duly mixed.
3. Do not mix much more nor any less than is necessary for the job on hand.
4. Keep the paint well mixed while the job is going on.
5. Have your paint of due thickness, and lay it on equally and evenly.
6. Do not apply a succeeding coat of paint before the preceeding one is entirely dry.
7. Do not use lighter color over a darker one.
8. Do not add dryers to colors long before they are to be used.
9. Avoid using any excess of dryer, or a mixture of different sorts.
10. Do not overcharge your bursh with paint, nor replenish it before it is sufficiently exhausted.

11. Begin with the highest part and proceed downward with your work.

12. Keep your bursbes in good condition; do not let them lay out to dry. I have a trough filled with water that I keep them in. When putting brushes away be careful that the bristles are all straight.

13. Keep your pots cleaned; your ladders, etc., painted.

OUTSIDE PAINTING.

This book is not intended for the amateur painter. Consequently I will not go into all the minor details of how all classes of housework should be done, but will give some ideas that, perhaps, will be of some benefit to the practical workman. I find, in my experience, that on some jobs it takes more time to get at the work than it does to do it, consequently the painter is obliged to devise speedy ways and means of getting at the work. I will give some of my ways —they may be odd to some, but new to others.

WINDOW SASH sometimes takes more time than all the balance of the outside work, and in priming, if you take them one by one, it requires considerable labor. A better way is to get two glass boxes and lay the sash on them, flat, with the munnions down, one the top of the other evenly; put as many on the boxes as you can reach down, and it will be the same as painting the inside of a box; use a 4-inch flat brush. I sometimes give sash two coats the same way before glazing, which will also save time, and the work does as well if you are careful and do not

get the sash dirty while glazing. One good coat will do for the tracing. In painting old sash run around the stiles, letting the tracing go for the first coat; then trace the second coat.

BRACKETS and scroll-work should always be primed before they are put up; and you will save time by giving them two coats, using the same color that the work will be finished in; then in the finishing coat you can leave edges.

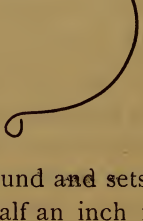
BLINDS.—If they are pivot or revolving slats lay the blind on the trestle, with the bar down; then paint the top side of the slats; then turn the slat over and paint the other side, then paint the stiles and the edge next to you; then turn the blind over and you will find both sides of the slats painted. Paint the bar, then the edge-slats; then in next the stile; then the slats; then set it away up side down, and wipe up all the runs, etc.

SWINGING SCAFFOLD.

It is a well known fact that the swing is a great improvement on the old style way of doing work, and for the information of the uninitiated, I will give a description of how to rig and work them. A 40 foot fall is enough for doing all ordinary work, unless it be in large cities where buildings are tall, but I will speak of a 40 foot swing. The two ropes should be not less than ¾ of an inch in thickness and 160 feet long, each, with double-pulley blocks above, and single blocks below. The stirrup should be made of

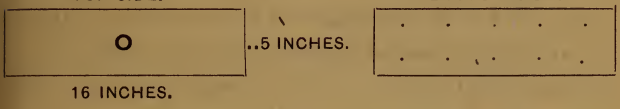
rope, and I would recommend to have as little iron about the rigging as possible. A ladder will do for the stage by covering it with boards. There are various modes of rigging on the building. One is the out-rigger, which is used only when the roof is flat. Let the out-rigger (a scantling 3x4 and 16 or 18 feet long) project over the cornice about 4 inches, and fasten the tackle to it with ropes; some have an iron ring on the out-rigger, on which to hook the tackle, but I prefer rope.

For general purpose I find the cornice hooks the best, they can be rigged the quickest. I have a pair that I have been using for a number of years, and I have not yet found the building that I could not use them on. They are made of ½ by 2 inch wagon tire iron, and bent edgeways; with a hole in the lower end to hook the tackle into. They are large enough to go over a very large cornice, and are shaped something in this style:



The top part is round and sets on a block that has a hole sunk about half an inch in it. The block is 5x16 inches, and 1½ inches in thickness. Pine will do. I use them for working in gutters or on cornices. I also have another set to work on shingle roofs.

They are made of hard wood and the same size as the others. On the top is the pivot hole, and on the bottom are little spurs to keep them from slipping.



They can be worked on gables, even if the roof be steep, and does not injure the shingles. I have also another set for slate roofs, that have rubber fastened to the bottom of the blocks. They are larger,—10x18 inches.

The swinging scaffold is certainly a great improvement on the ladder mode of getting at the work, and in the eyes of some requires a "sailor" to work it, but I would rather work off a swing on a building 3 stories high, than off a 16-foot ladder; for there is less danger of getting hurt, and it is not near so tiresome. Two good hands on a swing scaffold can go over as much surface in a day as four equally good hands can, in the same time, off of ladders. Hands are sometimes apt to become alarmed when doing gables, but if the swing is pulled up well and well braced out from the wall there is no danger. I have worked a step ladder on the stage to get at the points of gables, chimneys, &c. Set the foot of the steps as far out on the swing as you can, and lean the top against the wall.

BRICK WALL PAINTING.

New walls should be well rubbed down with a

brick and brushed off with a stiff broom the first thing, then they are ready for the

First Coat.—Yellow ochre and raw oil, with sufficient dryers to dry it. If the job is to be finished red, add a little Venetian red to the ochre. Do not go over again until it is thoroughly dry, which will be in two or three days. Give it more time if you can, because you will save time and material.

Second Coat.—Use raw oil and one-third turps if you wish the job to stand out well in the finishing. Some go so far as to say there should be no turps used in any of the coats for outside work, but I differ with them so far as the second coat is concerned. If the wall is to be red, use Venetian red, or, if it is to be stone color, mix the color as near what the finish is to be as you can. In this coat you are to do all the puttying-up as you go. When this coat is dry and there are dead or soft bricks, it would be well to coat them over with flat color very thin and quick drying.

Third Coat.—Boiled oil and the color in which the work is to be finished. If red, use Indian red or English Venetian, and if stone color nse ¾ WZ and ⅓ WL. The third coat should be worked as stiff as you can conveniently work it.

FLATTING BRICK WALLS.

The painter is sometimes called upon to do work of that description. Coat the wall first and second coat, same as previous article on brick wall painting. The "flat color" should be worked very quick, and you must be careful not to leave laps. Two, three,

or more men should work together and carry the reaches in such a manner as to avoid making any laps. "Flat" color is without gloss, or dead color. If you wish a dead flat use all turps, but that would be hard to work. The "flat" color properly prepared and put on should be applied within a short time after the last oil coat has become dry. This permits the "flatting" to adhere firmly and become a part of the oil coat, merely deadening the gloss; in this way there is no more danger of the weather having effect upon it than on a gloss, or even so much. The flatting is thus rendered less liable to change in color and more pleasant to the eye, as the roughness and imperfection of the wall are not so conspicuous.

PENCILING.

For brick wall. The work should be laid off in half bricks with chalk line, so as to put in the headers on a line, one above the other alternately. To do the aligning, use the common brick wall aligning-brush, which is about five inches in length; the brush with which to put in the headers is about two inches long; the straight edge, five feet in length and two inches in width, and one-quarter inch in thick ness, with a sharp beveled edge.

Penciling requires no ordinary skill, but oftentimes the boss-painter in small localities is called upon to do work of the kind, and is very often put to his wits' end to know what to do about it. One man in Michigan wrote to me that he had worked at painting for 40 years and had never been called upon to paint

a brick wall, and I know from the tone of his letter he is a practical painter. Penciling is very hard to do off of ladders, unless you rig a scaffold with them, which is done by standing two ladders alongside of the wall, lashing the tops to the cornice. Get a good, stout plank and have one end on one ladder and the other end on the other ladder. The swinging scaffold is the best if you have one. For color use white lead, oil, and japs enough to dry it, also turps enough to keep it from running. If you are inexperienced in that class of work, commence at the back of the house, or do the chimneys first, and by the time you get around to the front your work will be better.

WEATHER BOARDING OR SIDING.

In all classes of work it has been my idea to clean the work the first thing, and I find that it is the only way to do a good job. After cleaning, shellac all the knots and sappy places; then prime; then clean off and putty up all holes, cracks, etc. The color for the second coat should be as near the color that the finish is to be, as possible, and should be freshly mixed. Avoid using old fat colors, as there is danger of the next coat crawling. Use a little turps in this coat. I will say right here that a bad habit some painters have, is to try their color to see if it is the right shade on a few boards, in the most prominent place on the front of the house and where it is always sure to show. I would recommend the back or side of the house, or some less conspicuous place,

than the front, that is, if it is necessary to try the color at all.

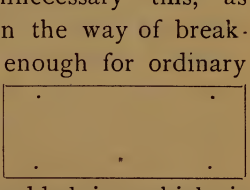
If the house is to be trimmed with different shades finish the cornice first, then you will avoid spoiling any work below by sprinkling, etc., the weather-boarding, carrying everything with you as you come down as near as you can, and avoid laps. Use boiled oil for the third coat, and as heavy as you can conveniently work it.

MOLD STAINS.

The stains should be well wet with cider vinegar. Let stand for a few hours, then wash with alum water and sulphur. I have sometimes shellaced the spots after washing.

GLAZING.

In fitting in the glass always put the bow side down, and in no case force the glass into its place. Glass should have room to contract and expand with the weather, so if you fit the glass in the sash tight it will be apt to break when it begins to expand with the heat of the sun, more especially large lights. Avoid driving in unnecessary tins, as they sometimes cause trouble in the way of breakage. Four points or tins are enough for ordinary small lights, and should be driven in the manner as shown in the diagram:



All large lights should be bedded in, which is done by running the putty in the munnions before

setting the glass. The putty for that purpose should be free from lumps and well kneaded. Do not bed the large plate glass that are set in with mouldings; they should be back puttied. One inch lap is sufficient for skylight glazing, and at the laps the glass should not touch each other, but should be separated by a piece of tin bent in the shape of an S, thus:

Two tacks over the lap are enough to hold the light in its place. They should be bedded.

When you wish to cut glass lay it on the table with the bow side down, then place the straight edge in its position and run the diamond along, holding it in an even position all the way. If you do not think that you have a good cut tap lightly the opposite side directly under the cut, then when you have it started it can be easily split.

INSIDE WORK.

Is usually done in "flats," sometimes dead, sometimes egg-shell. Whites I would recommend to work "dead," as they are less liable to turn yellow. But if you wish an egg-shell finish put a little damar varnish in it; use no oil. It is not always advisable where tints are used to work the color "dead," for in that case more material is used, for the oil helps to make the body, consequently the material will go

further. It is useless to enter into minute details as to how all the various kinds of inside work should be done, but will give my way of doing some of the more important kinds of work.

GLOSS WHITE, sometimes called porcelain white, Florence white, etc. It is useless to tell the practical painter that he should clean all the dust and dirt out of the room first, but it is necessary at times. I have known some of the best workmen in the country to prime the work and then clean up afterwards, but by so doing it causes more sandpapering and cleaning to be done. I will now treat on how a first class job is to be done. This is a class of work that must not be hurried.

1st. Clean all the work. Get all the dust and dirt out of the room; do not leave a speck of dust on the work or floor, use a good stiff bristle duster for that purpose.

2d. Coat the work with shellac varnish.

3d. If pine, size all the knots and sappy places with quick drying gold size, then lay on a leaf of gold or silver. That is the only reliable way I have ever known of killing knots.

4th. Coat the work with white lead mixed with turps and oil, half and half. Give this coat a sufficient time to dry.

5th. The putty should be white lead, whiting and japan. Putty up all the holes, cracks, etc. Let the work stand until the putty begins to harden, then sandpaper all the work in the room, then dust off and

sweep the floor. Right here let me say, some workmen will rub down a door and frame, paint, then go to the next and rub it down and dust it off, throwing dust all over the work they have just done, but that kind of work will not do.

6th. Coat the work with half white lead and half zinc, almost dead flat.

7th. This coat should be all zinc of the best quality; French green seal is what I would recommend. Put it on with a soft hair-flatting brush, and make it cover as well as you can. Work the color dead flat. This coat should be allowed to become hard.

8th. Now all depends upon the judgment of the workman. The work must have a good, white body, before it receives the final rubbing. If the work is not clear enough put on another coat of the same as the last, but not so heavy. Do not put that coat on until the work is thoroughly dry, then let the work get hard, the harder the better; then sandpaper. Use No. 1. If the work is not dry it will roll under the paper, and also gum up. Rub all brush marks down smooth; be careful not to rub the edges bare, but if you do, touch them up with color.

9th. Egg-shell gloss, that is zinc mixed with turps with one-half damar varnish. See that your color is clean, if not run it through a fine strainer. Use well ground Cal. Magnesia, or patent dryer, in this and the previous coats, except the first. Do not use japan as it is apt to stain the work.

10th. Rub down lightly with very fine sand-paper.

The work should be hard, the harder the better, for if it is any way soft the varnish will go in dead, and will necessitate one or more coats of damar.

The damar for this coat should be stained a little with the zinc, and should be flowed on quick. Look sharp for runs; if you see them start wipe them up before the varnish sets, for if you do not it will then be too late. I have put water in the varnish to prevent its running, but it is not advisable, as it does not do the varnish any good. It is sometimes necessary to give the work a second coat of damar, but do not do it until the previous coat is thoroughly dry, which will take about three days. If there are any runs cut them off with a sharp chisel.

White lead can be used the same as zinc but does not look so well.

The same rules should be observed in doing all grades of gloss work. When doing work in tints, you should be careful to use the same color all the way through.

MANTELS AND BASE.

In some localities where the room is finished in gloss white, mantels and base are done black. To do that and make a good job, I would recommend the following directions:

First Coat.—Ochre, ⅔; white lead, ¼, mixed with oil, ½, and turps, ½, with enough dryer to dry it.

Second Coat.—Ochre, ⅔; white lead, ⅓, with enough black O to make a dark lead color. Mix

with TT and rubbing varnish. This coat should be worked heavy, so as to form a good body to rub down.

Third Coat.—After plastering all the holes with quick drying varnish putty, rub down thoroughly with fine sandpaper, or, if you have time use lump pumice stone. Coat with drop black ground in japan, such as carriage painters use. Mix with TT and a little rubbing varnish, enough to give it an egg-shell gloss; thick enough to cover well.

Fourth Coat.—Same as above, except add a little more varnish, then rub down with hair cloth, and coat with best coach varnish.

Let each coat get thoroughly dry before adding another. If the base caps are to be white, be careful not to sprinkle the white work.

PAINTING PLASTERED WALLS.

Walls that have never been painted should be thoroughly cleaned and rubbed down; then give them a coat of glue size, then putty up all the holes and cracks. The putty for that purpose is made of whiting and glue water. Use no oil. In the large holes when the putty is dry you will have to reputty, as it will shrink more or less. Avoid using oil putty in this class of work, as the putty is apt to strike through. For oil finish—first and second coats half and half oil and turps; third coat all oil. If you have a bad wall or rough ceiling I would advise you to stripple. It is very easily done. If you have no stippling brush a bristle dusting brush will do.

Pounce each stretch as you do them with the point of the brush. You must be careful to pounce it all over evenly, and leave no holidays. Varnished ceilings and side walls are passing out of date. I do not advise them, for when you use zinc mixed with oil it is almost impossible for the inexperienced to tell the difference. But when it is necessary to have varnish finish, first coat should be almost flat; second coat two-thirds turps and half varnish, and for the last or varnish coat use almost clear varnish. Put enough color in it to stain it. The wall can be improved by running a stencil border around the room.

STAIRWAYS.

It is best to prime or fill the steps and risers before they are put together, especially if they are hard wood, and are to be finished in oil or varnish. Also, clean and fill the balusters and string board. Time is saved by even giving the balusters the second coat before they are put up.

It is very often the case that in the finish of a house that the stairway is left until the last thing, and then is rushed through in too big a hurry to make a good job, but my advice is to carry them along with the other work, so as to give each coat a chance to dry.

☞See article on varnishing.

VARNISHING.

FINISHING HARDWOOD.

The decoration of interiors by hardwoods, or their imitations, is fast growing in favor, and as much of its beauty depends upon the finish of varnish, or filling of the grain to make a smooth and durable piece of work, I have started out with this article to tell the reader how he may finish the wood in a satisfactory manner. There is more than one road to the same goal, and if I were to fully describe the methods employed by painters to form a smooth surface on the various woods, the article would be too long, and, possibly, not one-half so instructive, so I will content myself by giving directions for doing the work as done by the majority, and not those emanating from the manufacturer of some patent filler. The first thing in order, when about to put a finish on to wood, is to fill as fully as possible the pores. The wood having been nicely smoothed down with scraper and sandpaper, and thoroughly dusted. Then it is ready for the

FILLING.

When I have the time I use filling made from a receipt obtained from the GUIDE. But if I have no time I use Wheeler's filler. The filling I work medium heavy, and coat over, say about one-half of a door at a time, and when it commences to set, then commences the rubbing. I usually use excelsior shavings. In my experience I have found that it is best

to rub the work until it is dry, and the harder the better. Another thing that will be a help to some: The filling will sometimes dry before you have it all rubbed off. If that is the case, wet it with turps, and it will rub down all right. Pick all the filling out of beads and moldings, using a paddle sharpened to fit the places. It is much better to fill all casings, molds, etc., before they are put up, also doors.

PUTTYING.

The putty should be made of white lead, colored with chrome yellow, Venetian red and burnt umber. Match as near as you can. Crowd the putty into all holes, cutting it off with the knife. Then with a rag dampened with turps, rub all putty stains off. Go all over the work with No. 1½ sandpaper, rubbing down everything well, and dust off as you go. After the putty has stood long enough to become dry, then the work is ready for the

VARNISH.

Right here I wish to say that you can save 20 per cent. of labor if you will clean up everything in the room free from dust and dirt. Sprinkle down the floor and close up everything so that there will be no dust flying in the room. Do all this before you put on any varnish. I have seen some painters do a door and then go to the next one along side of it and dust off, throwing dust all over the work just finished. But that kind of work will not do. I use a chisel pointed, 3 inch soft bristle flat brush for large surfaces, and a 1½ inch flat for moldings, edges, etc.

Flow free, and do as little rubbing as possible. For this coat use quick drying rubbing varnish. This should stand until it gets hard so that you can cut it down with No. 1 sandpaper. If the varnish is dry the sandpaper will not gum up. The next coat should be a good quality of rubbing varnish and should be flowed on free. If the varnish is too heavy, thin a little with turps, but do not get it too thin, as this is the body for the finishing coat. If there is money enough in the job, cut it down with pulverized pumice stone and oil; but if not, cut down with hair cloth. This should be done with great care. See that the work is cut down smooth, and don't spare the elbow grease. Clean up everything free of dust, and sprinkle the floor for the last coat. This should be the best coach varnish, and should be put on just as it comes from the can, without being thinned. Turps will kill the gloss. Flow on free, and look sharp for runs.

HARD OIL FINISH.

There are a number of ways of putting up this kind of work. In the first place fill the wood with the filler, then rub down and putty up, dust off well, then flow on the hard oil, and when dry cut it down with No. 0 sandpaper and flow on another coat. When dry cut it down with pulverized PS and sweet oil. If you wish a polished job flow on another coat, making one of filler and three of hard oil. This last coat must get hard, then polish with rotten stone and

BO with woolen rag, and chamois to do the cleaning with.

ANOTHER WAY.—Get a good body with rubbing varnish or common copal; then cut the gloss of with BO and PS. This is the usual way furniture is finished, and is a very cheap one.

HARD WOOD FINISH AND FILLING.

Very few persons desire a high gloss on inside work, so there is very little need of varnish for this purpose, still a high gloss may be used sparingly with a most happy effect, especially in large rooms, on raised moldings, etc. The finisher, himself, must always be the judge as to how the work should be done. In kitchens, pantries, etc., where it has to be cleaned often, especial pains should be taken that it be done well, that it may stand the wear. The oil will have to be used principally. Chambers, etc., where greater care is usually taken in the selection of wood, and the surface is less exposed to friction, we can leave it, as far as the color is concerned, the same as it is left by the carpenter. The first thing, of course, is the proper preparation of the surface. The surface may be rough and the grain raised by moisture. If such is the case go over it carefully with No. 0 or 1 sandpaper, taking care always to sandpaper in the direction of the grain. Hammer marks, if found, should be touched a few times with a moist sponge until they come up even with the other surface.

OIL POLISH ON WOOD.

Fill the grain with SH varnish or wood filling; give two or more coats, sand down and apply two or three coats of oil polish; when thoroughly dry rub with tripoli and water until a polish is secured. Again cut the polish with fine PS and water and polish with sweet oil and rotten stone. The French method is to use powdered tripoli and BO to bring up the polish. The following is also a good way:

When the first coat of varnish is dry, it should be well rubbed over with pulverized pumice stone and water, or, in some cases, if clean and smooth, with a bunch of curled hair, to remove the greasy gloss, otherwise the subsequent coat would "crawl," "pit" or "enamel." The rubbing done, a thorough washing or dusting is the next thing in order, so that the second coat of varnish will be in good condition. "Hard oil finish" is recommended for varnishing hard wood, and I have every reason to believe that it will serve a good purpose in any place, where there is no chance for water to be spattered over it, for it being a sort of quick and hard-drying resin varnish it will turn white under such a situation. The varnish being dry, rub every part of the work with pulverized pumice stone and water to make it smooth and lustreless, wash clean and dry off with a chamois skin. If there be any parts that are to be glossy, flow over them a third coat of varnish, or polish them. To polish such work, there are preparations in market under the name of furniture polish, but an easy plan is as follows:

Take a long piece of list or coarse flannel, and roll it up in a wad, like a roll of tape; over this, wrap a piece of soft linen several times doubled up. Sew it on tightly and form a sort of handle by tying up a round wad. Next, pour out in a shallow dish some shellac varnish, dip the flattened side of the woolen wad into it and let it become well saturated. Now, holding the wad face up, drop upon it a little boiled oil. Proceed to rub the work in a circular direction, doing a little at once. Rub it lightly until the whole surface is covered; repeat this, putting on a little shellac and a little oil, but let each coat dry well or be rubbed dry, and do not put on too much of the liquid at one time. Keep the wad free from dust, as the polish depends much on the softness and cleanliness of the rubbing cloth. On parts, where the wad cannot be well used, a piece of flannel will answer. The polish thus given will be found superior to the lustre of the varnish, for it may be handled without injury, and then, also, if the lustre dies out, a few rubs of the moistened flannel with a drop or two of oil will renew it.

The principal thing in finishing hardwood is the filling of the grain. Scraping varnish, that is, a cheap resinous varnish is used by some, but considered by many as too expensive and tedious. In filling the grain by this plan, the wood is first varnished over three or four times, then when thoroughly hard, the varnish is scraped off with steel scrapers, leaving the pores in the wood well filled with varnish. Umber, venetian red, whiting, flour,

starch and silica are all used for filling the grain of wood, but I believe that the plan recommended, with corn starch as a base, is the best. Shellac varnish is extensively used for the finishing of wood and I have done some good work with it, but care should be had to purchase a good quality. The finest finish on flat work I have ever yet seen, was done by first filling the wood with Wheeler's filler, then varnishing with three coats of hard oil finish before alluded to, the final polish being made by rubbing with rotten stone and sweet oil. Almost every varnish manufacturer makes a filler for wood and full instructions are given with the material, and while some of these are excellent, there are others not worth using.

The imitation of hardwood by the use of wood filling, or pigments, as well as the enriching of real woods, demands a few words. There are parts of a piece of work that, sometimes, may be colored a shade or two darker, and give it a very good effect, and this should be done with transparent material or glazing. Asphaltum thinned with varnish to a glaze, put over mahogany or rosewood will make a handsome color. Carmine, lake and umber glazings, also, will improve any dark wood. Permanent wood filling—in two shades—may be put over pine wood to make an excellent black walnut color, or to stain it in any desired shade by mixing the light and dark grades in different proportions. Umber mixed with varnish and turpentine make a good walnut color. When woods are thus stained, the finish is given in

the same manner as on hardwood, but with all the pains which may be taken, the imitation of hardwoods by stains never reaches the beauty of the simon pure article. One of the causes of poor work in this line, is the almost invariable adulteration of the materials used with oil or turpentine, and it does seem strange that the house painter thus insists in putting into his varnish something which destroys it. It flattens or fails to fill up, and then turn all the blame on the varnish maker. Another cause is the disregard given to the preparation of the work as the rubbing with sandpaper or pumice stone, or the dusting off. But I believe that by following out the directions above given that a fair result will be assured.

VARNISHING PINE.

White or yellow pine I consider about as nice wood as you can work on and when finished properly looks about as well as any of the fancy woods. I have made a good gloss on yellow pine with two coats of varnish without filling. White pine should have three coats, one of filling and two of varnish. Sometimes shellac is used for filling, and where you wish to put up a cheap job, a good heavy coat of white glue size can be used to good advantage. When you go to do the varnishing over it, you must be sure that it is good and dry. The cleaning off process is a matter of great importance, for if the wood is not well cleaned before the varnish goes on the work will not look well. I have seen some

painters use a carpenter's plane to get a pencil mark off the work, but it always makes the job look worse than to leave the mark on, because pine will become weather stained more or less, accordiug to the time it is exposed to the atmosphere. Then when the spot is dressed off it will show bright and new, while all the rest will show the weather stain. To test this matter, get a fresh dressed board and lay it where the air will strike it; lay a small block upon it and let them remain for a few days, and you will find a bright spot where the block laid while the balance shows up weather stain.

Another plan I have seen some painters work, and that is a vigorous use of sandpaper. The result is about the same, only the job will look worse, because the sandpaper will rough up the wood and make it fuzzy. I will try and tell you how I get the work clean. I first use the duster and dust all off that will come off, and if there is any mortar or mud on the work, I clean it off with the knife, then it is ready for the varnish or filler, (we will say varnish). If it is a door that you have to do, start in with the panels; have a rough woolen rag with you and where there are pencil, or other marks, rub the rag over it vigorously while the varnish is wet, then rub the brush over it to straighten out. You will find that it will take but very few rubs with the rag to get a pencil or other mark off. I very seldom use filling for pine, either white or yellow, but start in with good rubbing copal and finish with coach. I contend that both the first and second coats should have not less

than three days to dry, before the next coat is applied. This plan should be more particularly observed when you want to finish in hard oil, for in it you should give each coat as much time as possible to dry. Much can be said with profit on the subject of rubbing. I do most of the rubbing on the first coat, using No. 1 sandpaper; rub down everything smooth, then dust off well. Sprinkle down the floor and put on the second coat. This coat should be rubbed with hair cloth or sea grass, or if you want to make an extra job of it rub down with pumice stone, but where pumice stone is used an extra coat should be applied, making four coats in all. Yellow pine does not require so much varnish as other woods, as it is usually full of resin, and in consequence the pores are already filled.

GRAINING.

One cannot reasonably expect to become proficient in the art of graining save by a regular course of training under the guidance of a skilful master, but it is within the power of the average painter to perform work of this character that may well pass inspection, when done with care and the observance of a few plain rules, such as I propose offering in this article. In the first place the amateur must not attempt too much in the way of embellishment or effect, but must confine himself to the execution of a neat, plain and substantial job, taking care to mix colors properly and to have his ground work smooth and in good condition for operating upon.

If the woodwork be old painted work, it must be rubbed down with sandpaper until smooth and even, all the cracks puttied up with hard drying putty [mixed with Japan to quicken its drying] and a coat of ground color applied. This must be mixed with nearly all turps, as the less oil enters into the graining the less will be its liability to crack after being varnished.

The grainer, as a general thing, is never satisfied with any job that he does but lets it pass, because, nine times out of ten, he is not paid sufficient to justify himself to put in more time on the work, consequently the work is butchered.

The tools necessary to do graining of the various kinds are as follows:

Oak.—1 set steel combs.
1 sash tool.
1 rubbing-in brush.
Rubber combs to suit fancy.

Walnut; Rosewood, Maple, &c.—
Long hog's-hair over-grainer.
Tube camels hair over-grainer.
Camels hair pencil.
Sponge.
Blender.
Rubbing-in brush and tool.
Stippling brush, [duster will do.]
Flat Fitch.

COLORS.

Vandyke brown in oil and distemper.

Raw and burnt sienna in oil and distemper.

Raw and burnt umber in oil and distemper.

Lager beer, oil turps and japan.

ROSEWOOD GROUND.—Do not use lead for priming, use ochre. Second coat; use Venetian red with a little chrome yellow in it, and tolerably flat. Use for last coat, American vermilion with a little chrome yellow in it. Work it almost dead flat. In preparing your ground see that your work is well rubbed and puttied before graining.

GRAIN.—Vandyke brown thinned with lager beer should be used for the over grain. Some use vinegar, but it does not work as well as the beer, and it should be diluted with sugar and water. The growths should be put in with the brown in oil. Use a fitch for the growths; the over grainer and pencil for the grain, which, after it is dry, thin down and put on a glaze over all. Shade as you go. Then varnish when dry.

BLACK WALNUT GROUND.—Mix as near a dove color as you can, as follows: white lead, chrome yellow, Venetian red, burnt umber and very little black.

GRAIN.—Stipple with burnt umber 3 parts, raw sienna 1 part; thin with beer. A common duster will do to stipple with. Work in the growths with burnt umber on oil; with pencil blend them out well, and when dry put on thin glaze in oil; add a little raw sienna to the umber. Wipe out with rag. Put

in dark, heavy knots with a fitch or small sash tool. It is done by twisting the brush around, and with very little practice is easily done, and sets off the work to good advantage. When dry, varnish.

WHITE WALNUT GROUND.—Dark buff or russet color. Stipple with raw umber in beer. Put in growths with raw umber 3 parts, burnt umber and raw sienna 1 part, in oil, and when dry thin down, glaze and shade.

In graining walnut woods, nse the flat overgrainer brush and pencils.

ENGLISH WALNUT GROUND.—Very light buff. Stipple with burnt umber in beer. Overgrain with Vandyke brown in oil. Thin down, glaze and shade with the same. Varnish when dry.

OAK GROUND.—Light buff. White lead, chrome yellow and very little Venetian red. GRAIN with burnt umber, raw sienna and very little burnt sienna in oil and turpentine, half and half; add a little beeswax dissolved in oil. Beer will answer. Use the steel comb; and also get a piece of rubber about 4 inches long, 2 inches wide and ¼ inch thick, and cut notches in it about ¼ inch apart. Use the rubber for the heavy growths. After using the rubber draw the steel comb diagonally across the work. Use soft canton flannel over the thumb nail to wipe out the lights, hearts, etc. When dry shade with same color; throw in shades with rubbing-in brush and tool; wipe out with rag. I can give you no designs, but would advise you to study the wood, and do not try to beat the one that made it grow.

PINE GROUND.—Light buff. Grain with burnt sienna in oil.

MAPLE GROUND.—Same as oak. Grain with raw umber in beer. Use the points of your fingers to make the bird eyes, by tapping them slightly on the wet color, and a flat varnish brush to make the curls, etc., also, overgrainer to make the growths.

MACHINE GRAINING.

It is very easy to do this class of work, if the workman has but a slight knowledge of graining and the proper manipulation of the colors to be used.

The process of making the machine is as follows: Get a piece of oak, ash, or walnut that has a nice grain. The piece should be about 2 feet in length by 8 inches in width. Plane it down smooth. Raise the grain by wetting it with warm water on both sides. If you put it in the sun to dry, turn it over every few minutes to avoid warping. Tack a strip on the sides and ends, or what is usually called sideboards, to keep the composition from running off the mold. The composition is made as follows: 3 lbs. common G; let it soak in enough water to cover it until it is soft. Put it into a kettle and let it boil very slowly; keep stirring all the while until all the lie is dissolved, then add 3 pints of New Orleans molasses. Oil the mold, then pour the composition warm into the mold (which should be set level) until it is about ¼ inch thick; lay a piece of canvass on the top of it evenly, and when dry lift it out, cut the edge square,

and when it is dry it is ready for use. Place the pattern on a rocker the size of the pattern, coat the face of the pattern with graining color, using a soft brush and press it on to the door.

It will cost you but little to experiment to make good work with it.

STAIN GRAINING.

In addition to the art of imitating the graining of woods, marbles, etc., by oil colors, there are methods of bringing out with effect and beauty, as well as of preserving the natural graining of woods, etc., and also of imitating, heightening and improving them artificially, though less practiced are not less ingenious or worthy of attention from the grainer, it being desirable to heighten and preserve the natural beauty of the woodwork as by artificial painting to imitate them or hide their defects. For bringing out the natural grain of woodwork where it is of sufficient beauty, it is enough to apply successive coats of drying oil or to varnish the naked work till it bears out, which is sufficient for ordinary joiner's work, but for the nicer cabinet work, in which the choice ornamental woods are employed, French polishing is necessary, which is performed with a spirit varnish containing lac, applied by rubbers with linseed oil, and is now so common as to have become a distinct business.

In other cases graining may be performed on the naked wood with transparent colors in turpentine or water, which, when dry, may be varnished or French

polished, or the same may be done on the ordinary woods previously stained of the colors of the more valuable sorts. A beautiful variety of graining may be executed with acids on plain wood brought out by heat, in which way the nitrous acids or aqua fortis applied affords amber and yellow shades; and the sulphuric acid yields shades of a dusky and darker hue, so as together imitate the various hues of the tortoise shell, etc., after which the work is to be cleaned off and varnished or polished.

FLOAT MARBLEIZING.

This is the same process by which iron or slate mantels are done, and I have done wood the same way with very pleasing results.

1. Give the wood a good body; see that it is well rubbed down, and finish with the ground you wish.

2. Have a tank, 3 inches deep, large enough for the work to go in. Fill the tank with water, add 2 ounces of gum tragacanth for every gal. of water.

3. Mix your colors with TT, add a very little RO, put colors in bottles, add 1 teaspoonful of beef gall, shake up well; sprinkle the colors evenly on the water. When you have the colors arranged satisfactorily, dip the work in evenly; when dry, varnish.

MARBLEIZING.

The workman should have a good idea of the stone of which he is to imitate the colors, general

formation of veins, etc. Paint the ground-work, and, when dry, coat with slow drying color, then work in your veins, etc.

ITALIAN MARBLE.

TOOLS.—Camels hair pencil, feather, blender and sponge.

GROUND.—Black.

WORKING COLORS.—Cold tint for bright veins burnt sienna, white and yellow ochre, oil, turps and japan.

Scramble out, in patches, with thin white lead, with a sponge; blend; then with the hair pencil trace in the large dark veins with burnt sienna, then with the yellow ochre, and lastly with the gold tint, running the lines over each other, yet all having the same general direction. It will be seen, from the specimens, that these veins are series of irregular loopholes and patches of light, crossed and connected by sharp, crinked and angular lines, the whiter lines being the sharpest.

When veined and dry, glaze with very thin asphaltum, in patches, to give it depth. Then varnish, and, if desired, polish.

VERD-ANTIQUE.

TOOLS.—Same as for Italian, only fitches are used instead of pencils.

GROUND.—Black.

GRAIN COLOR.—White, yellow ochre and green.

Scramble in large flakes of white with the sponge, and blend.

Trace in the other tints in veins, something similar to Italian, only less veins, and more heavy, being done in large, irregular circles. Blend softly.

SIENNA.

TOOLS.—Same as above.

GROUND.—White and raw sienna.

GRAIN COLOR.—Raw umber, raw sienna, white and black.

Cloud it over with a thin buff tint, in patches, using a sponge.

Vein with raw umber for dark, and raw sienna and black, mixed to a green tint, for the lights.

The form and character of this is similar to verd-antique, only the rings are more regularly round.

Blend lightly, and varnish when dry.

WHITE.

Ground in the work, white; and while the last coat is wet, light a tallow candle and smoke the work in spots, and run lead-colored veins from spot to spot.

GRANITE.

GROUND.—Dark dove color.

GRAIN COLOR.—White black and Venitian red.

Sprinkle evenly with brush by hitting it with a stick.

STAINS.

TO MAKE RED SANDERS STAIN.

Fill a bottle of any size a little more than one-quarter full of red sanders, then fill the bottle up with AC. The AC extracts the color from the sanders, and the liquid is called sanders stain, or red sanders stain. The more red sanders you put into the bottle the stronger will be the stain, while it can at any time be diluted with AC to make lighter shades. The longer it remains in the bottle the more color will be extracted. Always strain it through a piece of thin muslin before throwing the grounds away. Ask for RED SANDERS at any drug store. It is a red wood-dust. Ten cents a pound is what I have been paying at all wholesale druggists. Do not ask for less than half a pound, or you may be charged a high rate.

TO MIX SANDERS STAIN WITH ASPHALTUM VARNISH.

If you pour red sanders stain in with asphaltum they will not mix of themselves, but by adding TT sufficient to thin to a proper consistency, the TT will cause both stains to unite. The sanders gives the red shade, and the asphaltum gives the dark—more or less of either will give the required shade according to the strength.

N. B.—The stronger the red sanders stain is made the less of it will be required to give sufficient red

and of course the less AC will be used. It requires very little sanders to get red enough. It is the liquid, not the grounds of the red sanders you mix with the asphaltum. The grounds are, as stated in making sanders stains, thrown away. After mixing these two stains you had better strain it to take the dross from the asphaltum.

ON MIXING AGAIN.

Red sanders stain can be mixed with umber ground in oil or turpentine. TT will mix it with all other colors, and it is better and more of a mahogany or rosewood red than all other stains. TT will also mix asphaltum with umber, and make it adhere to the wood better. In fact a number of practical experiments can be made with sanders and asphaltum mixed with many other colors, turpentine mixing them either with oils or alcohol colors, and of course with turpentine colors.

WOOD STAINS.

LIGHT WOODS TO MAHOGANY.—Mix red sanders stain and asphaltum stain (see mixing stains), and when it is the desired color apply with a brush. Do not have the stain too thick. If the wood is not stained sufficiently red to suit your fancy, you may put red sanders stain in the varnish, and every coat of the stained varnish will make the wood more red.

N. B.—The stronger the red sanders stain is made the less it takes to color the varnish. And thus you use less AC, which is at present prices the most ex-

pensive article you have to get. Thin the varnish when you mix stain with it for first coat; by so doing you can spread the color more evenly (in mixing stains and varnishes).

WALNUT TO LIGHT MAHOGANY.—With either a rag or brush rub over the wood a coloring of red sanders stain, and you have a perfect mahogany. And by either oil finishing or varnishing, the color will be brought out. Red sanders dries almost immediately, and can be finished right off.

N. B.—Some walnut wood is light, some dark; consequently make the stain strong or weak to suit the wood. You can at any time give more coloring to wood if necessary by mixing stain with the varnish, even after varnish has been applied to the wood.

WALNUT TO DARK MAHOGANY.—First go over the work with asphaltum stain, then with the sanders; be sure you do not have the asphaltum too thick or the work will be too dark.

ANOTHER MAHOGANY STAIN.—Dragon's blood used the same as red sanders, but it is too expensive and does not stand so well.

AGAIN.—By applying aquafortis diluted with water to dark new woods it will make a mahogany, but I don't recommend it, as aquafortis is expensive and dangerous.

TO DARKEN MAHOGANY.—Use sal soda or lye, but do not have it too strong; dilute with water. This is to make light mahogany into dark spanish.

MIXING STAINS WITH VARNISHER.

Red sanders stain and asphaltum stain can be mixed up with varnish. If the varnish is made from turpentine, they will mix readily. If made from oil or alcohol, turpentine will cause the asphaltum to mix.

KNOTTY PINE MAHOGANY.—Mix whiting with warm water to consistency of thick white wash, put in as much Venetian red as will give it a red appearance; now mix in sufficient dissolved glue as will make the mixture adhere to the wood. By giving the wood two coats of this mixture the flaws, knots, etc., will be hidden, and when well dry, rub off the loose sizing, then varnish with red sanders stain in the varnish, and you will have a very good appearing stain. Brown umber or any color may be used in the above sizing to suit the fancy for colors, or to darken the mahogany.

WALNUT FOR WHITE WOOD.—A solution of equal parts of permanganate of potash and sulphate of magnesia applied to white wood by means of a brush will produce an excellent brown color, resembling walnut. A second coat may be required after the first coat is dry.

WALNUT AGAIN.—Burned umber, burned sienna and boiled linseed oil ground fine. This is not durable, as the oil or varnish is required to protect it from coming off.

WALNUT AGAIN.—One ounce gum asphaltum, three or four ounces turpentine, one ounce boiled

linseed oil and Venetian red to color red—an old way.

IMITATION BLACK WALNUT.—Poplar or white wood treated as follows will assume the appearance of finest black walnut. The wood must be dry and warm and then coated once or twice with a strong aqueous solution of extract of walnut peel. When half dried, the wood is brushed with a solution, compounded of one part by weight of bichromate of potassa in five parts of boiling water and after drying thoroughly is rubbed and polished. The stain penetrates to the depth of from one-twelfth to one-sixth of an inch.

FOR ROSEWOOD.—Dissolve two ounces pulverized extract of logwood in one pint of boiling water (better let it boil till it is dissolved). Apply two coats to the wood while hot, and to make the rosewood grain, stripe it according to fancy, when dry, rub off all the black you can with a rough cloth.

ROSEWOOD AGAIN.—Half pound of red sanders and half pound logwood, boiled in one gallon of water for one hour; strain and add half ounce of powdered AN; go over the wood with this while hot, and when dry form dark streaks with logwood without red sanders, boiled in the same proportions. The dark streaks can be made black by adding one-quarter of an ounce of green copperas to the gallon of a pure logwood stain. You can shade the first mixture by proportioning the red sanders and logwood in the first stain.

BEAUTIFUL SHADES ON LIGHT COLORED WOODS,

Can be made by holding a flat piece of red hot iron close to the wood, so as to scorch it irregularly; also, by heating sand as hot as you can and throwing it on the wood in uneven thickness. This will bring out very beautiful shades.

CHERRY.—Rub over the light wood the red sanders stain, and it will be a good cherry, but do not have the stain too strong, or it will be too red.

CHERRY AGAIN.—Boil one ounce annato in 12 ounces rain water; when the color is well extracted put in a bit of potash the size of two peas, and keep it on the fire a half hour or longer. This raises the grain.

SATIN WOOD.—Can be obtained with very light sanders stains on light woods. It must only be tinged.

STAINS FOR VENEERS.

RED.—Brazil wood, fourteen parts; alum, four parts; water, eighty-five parts. Boil.

BLUE.—Logwood, seven parts; blue vitriol, one part; water, twenty-five parts. Boil.

GREEN.—Verdigris, one part; vinegar, three parts. Dissolve.

YELLOW.—French berries, seven parts; water, ten parts; alum, one part. Boil.

PURPLE.—Logwood, eleven parts; alum three parts: water, twenty-nine parts. Boil.

Apply the above with a rag, hot, (except the green). These stains will raise the grain, and must,

of course, be rubbed down before varnishing. They will not be suitable to go over old varnish, but are good for old veneers.

Remember This.—It is impossible to give the quantities in many receipts. Sometimes you purchase things with more coloring matter, and less would be required. The liquids are sometimes of a higher proof, and in a thousand and one ways you may go wrong if exact quantities were given. Experiment with a very little, and do not spoil or waste any large quantity. This refers to shades of stains mostly.

Staining Floors, Old and New.—To half a pint of asphaltum varnish, add two tablespoonfuls of umber (ground in oil); thin this with boiled oil and turpentine (half as much oil as turpentine); then shade with red sanders stain, and by mixing a little turpentine varnish, it will wear better. Apply with a brush, not too thick, and mix in a little japan dryer to dry the varnish.

Orange Stain.—Use vermilion or carmine mixed with chrome yellow, and be sure and have a good full yellow, or it will look poor and watery.

Salmon Stain.—Dutch pink and red sanders stain.

Flesh Color.—Can be made by using different quantities of Dutch pink and red sanders stain.

Purple Stain.—Lake united with Prussian blue or carmine.

Purple.—To a pound of good chip logwood, put three quarts of water, boil for an hour, then add four

ounces of pearlash and two ounces of indigo compounded.

SIGN PAINTER'S DEPARTMENT.

LETTERING.

A Roman letter is the standard. No painter need boast of any accomplishment with more pride than to be able to make a good Roman letter. When he can do that he has laid the foundation for the making of all kinds of letters.

Letters are composed of stems, curves and dashes. A stem is upward and downward strokes. A curve is a part of a perfect or imperfect circle. A dash is a horizontal line. Stems are of two kinds: first, a narrow stem like the first and third stem of an M; second, a broad stem is like the second and fourth stem of an M. A curve is like an O or the right stem of B, R, P, etc. A dash is like the line that connects an H, A, etc., and forms what is called the bierd of a letter. The body of a letter is from outside to outside of the stems. A light stem is called an up-stroke, a heavy stem is called down-stroke. An up-stroke should correspond with the bierd. The body of the letters should all be of the same breadth. An I is the only exception.

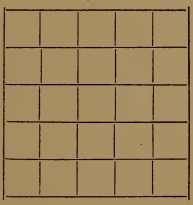
The eye is naturally educated to divide letters by space. When a wide letter is placed with narrow ones, it destroys the harmony, for the eye delights in harmony as well as the ear. There is another

vulgar habit. That of making the lower curved stem of the R, to set in. That is a deformity. Some men stutter or lisp to be attractive, or knock one eye out or cut off a leg or a finger. These are violations of the rules of nature. In music we have seven natural sounds. A single sound, such as a pig squealing, is terrific; but three pigs squealing in one, three and five, the sound is in unison and destroys the harshness; therefore, harmony will render delightful the most disagreeable objects or sounds either to the eye or ear. So in making any kind of a letter be careful of uniformity in space and size. Any one who can make a Roman letter can make a Block or Antique. But letters are too much in the habit of being too monotonous. The first thing is to look at the signs in the neighborhood, and then use your best judgment what style of letter will be most suitable. A name should be in Roman whenever space will admit of it. An ornamental letter is easily made. First select a leaf or scroll for a stem and make every heavy stem alike. I always made an ornament of my own. I find but few good script capitals in any book. They are deformed, the up-strokes are heavy, when in fact they should be light. It is just as much out of place as it would be in making a Roman letter. People who adopt such a departure have no regard for order. The main feature is uniformity. The best brushes are camel's hair and sable; not too long or too short, and should be the full size of a light stem, so that one line will complete a stroke.

THE METHOD OF LETTERING.

FULL ROMAN.

This analysis is that of the Roman alphabet proper, usually denominated the full Roman, and by printers "upper case." It is the most perfectly formed of all the alphabets, making no departure from strictly geometric rules, but adhering in every particular to lines which are either perfect curves or straight lines. Many Roman alphabets so called, such as the straight Roman, the Chicago Roman, etc., are not correctly speaking the true, from the fact that the curves are not perfectly constructed, varying from a true circle. In this analysis we have adopted a method in very general use by the best authorities on this subject, each letter being placed upon a frame work of five spaces in height and five in width.



Thus giving to the student a just proportion of the letters as compared one with another, and also enabling him to increase or diminish the size of the squares. By this method the letters can be extended or contracted by changing the proportion of the width of the squares as compared with their height,

and the letters can also be placed at any angle. The working scale or size of square should always be equal to the width of the body or stem of the letter. It will be seen that the letters differ very materially in width, as for instance: A, C, D, G, M, O, Q, R, T, V, Y, Z, and the character &, are all full letters, that is the height and width correspond; while in B, F, H, L, N, P, S, U and X, the breadth is 4-5 of the height, and in W the breadth is greater by 2-5 than the height.

The body of the letter should be 1-5 of its height, except in the curved letters, when it should be widened a trifle, as otherwise it would have the appearance of being thinner, owing to the fact that the space between the curved lines always appears less than that between straight lines. The fine lines should be hair lines, and when a scale of one inch is used, that is in five inch letters, this line should not be over one line, or ¼ inch in size. The width or spread of the small curves (sometimes called grace lines) should be ½ the width of the body of letter, and the spurs should project as much further, thus together equaling 1-5 of the height of the letter. In some cases it is necessary to make the curves and spurs at the bottom of the letter a little longer than at the top.

The A is a full letter, the outside oblique lines should be drawn from a point 1-10 the width of the letter, to the right of the center upon the upper line; the cross line should be a little below the center of the letter; the grace lines and spurs upon the hair

line should be made heavier than those upon the body.

The **B** is a four-fifths letter; the cross line should be placed a trifle above the center, thus making the lower curve a little longer than the upper, and giving the letter stability of form; the curves can be made with compasses, by using the points marked with crosses as centers; the width of the body of the curves should be a trifle more than 1-5 of the height of the letter.

The **C** is a full letter; the outside line is the circumference of a perfect circle; the inside curve can also be drawn with compasses by changing the center illustrating a crescent. The body of the letter should be a little more than 1-5 of the height, and the heaviest part should be below the center, the perpendicular line on the head should be a little within the circle, so that the lower part of the letter will appear broader than the upper part.

The **D** is a little less than a full letter; the large curve is a perfect arc; the inner curve can be made by changing the center and using the same radius as for the outside curve; the body of the curve should be a trifle wider than the upright body.

The **E** is a four-fifths letter; the lower should be a little longer than the upper; the grace lines of the heads should be long and made with perfect curves; the perpendiculars of the lower head should be extended a little longer than the upper; the center piece should project just one-half of the distance to

the outside of the letter, and be placed a little above the center.

The same rules apply to the **F**, which is a four-fifths letter, with the exception that the perpendicular of the center pieces should be a little longer than in the E.

The **G** is a full letter and the rules for making it are the same as for the C, with the exception that the greatest width of the body should be directly at the center of the letter; the lower right hand part of it should be fully one-fifth of the width of the letter and the horizontal line should be drawn a little below the center, and extend from the center to the same distance outside of the letter as the spurs.

The **H** is a four-fifths letter; the cross line should be placed above the center, and the lower grace lines should be a trifle longer than the upper.

The **I** is one-fifth of the height; the lower curves should be a little longer than the upper.

In the proportions of the **J** authorities differ, some giving it four-fifths and others three-fifths of its height. In this analysis I give it as a three-fifths letter, the ball is two-fifths of its height, and should be an oval in form.

The **K** is a full letter; the body is one-fifth of the height. From the upper inside point of the body draw an oblique line to the lower right hand corner of fifth space; then form a point on the body two-fifths of the height of the letter from the bottom line, draw another oblique line to the upper right hand

corner of the fourth space on the upper line, a more definite understanding can be had from studying the letter.

The **L** is a four-fifths letter; the perpendicular line of the arm should be about one-half the height of the letter, the same as in the F.

The **M** is a full letter. The middle lines should meet the lower line at a point three-fifths of the width from the right hand of the letter; the small curves on the hair line should be heavier than on the other letters.

The **N** is a four-fifths letter; the grace lines should correspond with those of the M; the left hand one, however, should be a trifle heavier than the right hand.

The **O** is a full letter, and can be made by following the rules for making the G.

The **P** is a four-fifths letter. The cross line should be at the center of the height of the letter; the curves can be made with compasses, and the body of the curves should be a little more than one-fifth of the width of the letter.

The **Q** is a full letter, and is made the same as the O; the tail should extend to the outside limit of the letter to the right, and should be at least one-fifth of the height of the letter below the line; and it will be found well not to vary much from the line of beauty in its formation.

The **R** is made the same as B or P, with the exception that the tail is extended, making it a full letter. The shape of the tail varies with different

authorities, either being brought down to a horizontal base and finished with a spur, or curved at the end; in either case the general outline should be the line of beauty.

The **S** is the most beautiful and the most difficult letter of the alphabet to form correctly. It is a four-fifths letter, and it is formed by two lines of beauty. The upper half should be a little smaller than the lower half. A convenient manner of drafting this letter is as follows: Take as centers, points three-tenths of the height of the letter, from the left hand upper corner and right hand lower corner, describe two circles and connect arcs. This is not absolutely correct, yet it will serve as a guide to untrained hands, and from it can be formed a perfect letter by changing the curves a little.

The **T** is a full letter. The upright lines should be two-fifths the height of the letter, and the grace lines should correspond with those of the E and F.

The **U** is a four-fifths letter. The hair line on the right, with the grace lines corresponding with those in the N. The curves at the bottom are made with a radius of two-fifths of the height of the letter.

The **V** is a full letter. The hair line, with the grace line, is formed similar to those in the U. The point where the oblique lines meet on the lower line should be equally distant from the outside limit of the width of the letter.

The **W** occupies more space than any other letter, being a seven fifths letter. The points on the lower line for the meeting of the oblique lines should be

two-fifths of the height of the letter from each side, and the body of the second V should occupy the middle space of the upper line. This can best be understood by studying the plate.

The **X** is a four-fifths letter, formed simply by an oblique cross. Care should be taken, however, to have the upper half a little smaller than the lower half.

The **Y** is a full letter. The upright part of the body should be just one-half the height of the letter, but the point where the hair line connects with the body should be a little above the center of the letter.

The **Z** is a full letter. The lower arm should occupy the whole width of the letter, but the upper arm should be about one line shorter. The perpendicular lines from the arms should be about two-fifths of the height of the letter, the right hand one being a trifle longer.

The character **&** occupies a full space. In the form of this character authorities differ very materially. It is an abbreviation of the Latin word *Et*, meaning *and*, and was originally a perfect representation of the letters *E* and *t*, but time has changed its form so that its original signification can scarcely be distinguished. The form given here is the most popular, as well as the most graceful, and coming nearest to the original can be made as follows: With a radius equal to about three-tenths of the height of the character describe an arc of three-quarters of a circumference from the left hand termination of the arc with a loop form a curve ending in an oval, this

forms the E; from the other extremity of the arc draw a line of beauty to the upper line of the space, this forms the cross of the t and completes the character. The body of the curve should be one-fifth the height of the letter.

LOWER CASE ROMAN.

The small class or lower case Roman letters are not so universally employed by sign-writers as the capitals, yet there are times when a knowledge of their forms and proportions is very important, especially with designers and draftsmen.

Painters vary considerably in forming these letters, yet the proportion of the height should always be preserved, in order to form well balanced and graceful characters. It will be observed that the proportion of these letters differs a little from that of the capitals. In all of the full space letters, b, c, d, e, g, k, o, p, q, v, y and z, the height is a trifle greater than the width; the body of the b, d, f, h, k and l extend three spaces above the line, and that of the t two spaces; the body of the g, j, p, q and y extend three spaces below the line; the m and n are 7-5 space letters. The body of each letter should be 1-5 of the height of the letter. The f, j and r are 3-5 space letters, and the l and i 1-5 space letters.

The curve of all the letters, with the exception of those of the a, lower part of the g, and the s, can be made with the compasses. The spurs should extend at least 1-10 of the height of the letter; the small curves or grace lines may be used or not, as tastes dictate.

The capital dipthongal characters Æ and Œ occupy an 8-5 space each, and are made according to the rules for the capitals, except that the body of the E is incorporated as a 1-5 part of the A and O. The lower case dipthongal characters also follow the rules for the small letters, the character æ occupying an 8-5 space, and the œ a 9-5 space.

In addition to the Full Roman there are other forms of the Roman letter, among which a few of the most popular are the Straight Roman, Chicago Roman, Italic, and Antique or Old Style. It will be needless to give a full analytical plate of each of these forms, as the analysis of the Full Roman will answer as a guide for their construction.

THE STRAIGHT ROMAN

Differs from the Full Roman from the fact that the outlines of the body of the letter are straight lines, the small curves or grace lines which characterize and beautify the full letter being dispensed with; this letter is also slightly contracted in width, being as a rule about 4-5 of the height. The C, G, K, O, Q, T, X and V should, however, be nearly full space letters, and the M and W should occupy about a 6-5 space. The lower case letters of this style differ from those already given only in the fact that the grace lines are not used.

BLOCKS.

The finished block, either round or square, will be given the same space as the Roman.

The unfinished block will occupy the same space, except the **M** and **W**, which will require one-fifth more space, the **I** one-third the space. The rule for the formation of all letters is as follows:

DIAGRAM.

a a—Top and bottom lines.
b b—The space the letter occupies.
c —Center line.
d d—Body lines.
e e—Used only in block letters.

SPACING.

In laying off work avoid using the lead pencil. I would recommend the use of soft chalk, which can be rubbed off easily when finished.

A good way to space a sign that is to be painted on a brick wall, is to follow a mortar joint for top and bottom lines. Count the number of bricks running through and divide by the numher of letters and spaces. For example you wish to paint the word GROCERY. You have here seven letters; give one-half of a space at each end; which would make eight letters and spaces; and the sign is 20 bricks long. The size of the space for each letter would be 2½ bricks, and 1¼ bricks at each end. The same rule can be observed on board work, by measuring the length of the line and dividing into feet and inches.

TO GILD ON GLASS.

SIZE: Take a piece of isinglass about the size of a twenty-five cent piece, and put in a pint of rain water scalding hot; stir until the isinglass is dissolved, then filter through filter-paper; then add one tablespoonful of good whisky; let stand one day before using. This size will keep a year in a bottle corked up. It will work much better when it has stood two or three weeks.

Good, clear white G will answer if you have no isinglass.

It is sometimes very convenient for the house painter to know how to do a job of glass-gilding, and after a little practice it can be done very successfully by following the directions here given. In the first place good work cannot be done on poor glass. If plate glass cannot be had, then the best French glass

should take its place, for to the purity of the glass do we owe the greater part of the brilliancy of the work. Having secured the glass, proceed to clean it thoroughly with whiting and water, polishing it on the wrong side with tissue paper. Apply the size plentifully to the glass with a clean camels-hair spalter, and with a tip throw on leaf somewhat in excess to the space needed for the work, and when this is done let the whole dry, setting it up edgewise. When dry, take refined cotton and rub briskly until the desired lustre is obtained. If most of the leaf has been rubbed away, no matter, the lustre has been obtained. Now lay a second coat in the same manner as the first. When dry go over it again with cotton, lightly, touch up all the bare spots with leaf, by wetting with the breath. When done it is ready for the design, which must be drawn on paper, pricked and pounced on the gold in a reverse position, for the same is to show from the opposite side of the glass. Having pounced it, proceed to paint out the whole design with drop black in Japan, except such places as may need coloring or to be flatted. Then wash off the surplus gold with water. If the sizing is a little too strong add a trifle of naptha to the water when washing. Such places as are to be colored can now be attended to. If flat gold is to form any part, the space left for it is to be laid with ordinary varnish-size and leaf laid in the ordinary manner, which on the opposite side in contrast with that which is burnished will be very dead or flat. Do all shading backwards, and when this is dry all

is done, and if glass, tools, water and room are clean, a fine job may be expected. Silver leaf is worked the same way.

TO GILD ON WOOD, &c.

First get a body with flat paint, not less than three coats on wood, or two on tin or iron, rubbed down smooth. If it is a sign you wish to gild avoid laying off with lead pencil, use the soft chalk, then brush off with duster.

For Size, use old fat linseed oil, the older the better, mixed with orange chrome yellow; put a little best Japan in it, thin with TT. Let stand 10 hours, or until it is tackey, then gild.

There are various methods practiced by painters in laying gold leaf. The old method required the use of a "Tip," cushion and gold-knife. The tip is a camels-hair brush or lifter, made from two layers of pasteboard, between which a small quantity of camel's hair is laid flat and the parts glued together. The cushion is simply a piece of chamois skin stretched tightly over one side of an oblong piece of wood six by eight inches, a layer or two of woolen cloth or of cotton is, however, first fastened to the board. The gold-knife has a long narrow and flexible blade with wooden handle and is worthless for any other than the purpose intended. The gold-book is held in the left hand and a leaf of the book is carefully turned back which exposes a leaf of gold, which is pressed upon the cushion by a dexterous reversal of the hands. Should the leaf wrinkle, a puff of the

breath directly from above it, will usually straighten it. Next, with the gold-knife cut the leaf into the widths required for the work, and by means of the tip lift so much as the hairs will cover, and apply to the "size," beginning at the outer end of the hair.

The tip must be drawn over the hair or beard occasionally in order to cleanse it from small particles of gold, and to slightly grease it. Ornaments, letters and scrolls are usually gilt from the book direct. Another mode is to remove the gold-leaf to an empty book, the leaves of which have been slightly greased with soap or beeswax, after which the book is cut up into the required widths, and the gold is laid on by exposing and applying it from the cut pieces.

GILDING FRAMES.

This class of work requires more appliances than the general run of house painters have. I use gold lacquer, and sometimes good coach varnish, for size. Bronze may be used with good success by coating over it with clear white SH varnish.

LIQUID GOLD FOR CHINA DECORATION.

Powdered gold, which is prepared by grinding gold leaf with white honey on a porphyry slab until reduced to the finest possible state of division; this is mixed with a thick gum arabic and powdered borax. With this mixture the design is traced on china, etc., and baked in a hot oven. The gum is then burnt and the borax vitrified, and at the same time the gold is fixed on the china.

FLOCK AND SMALT.

If it is a gold sign that you wish to flock or smalt use slow drying colors and very thick, taking care that the color is not fat or greasy, or it will spread and show a rough edge. To flock or smalt other work, see that the work is flat where you do not want the flock or smalt to stick. When the color is on sift the flock or smalt over the work evenly, let it remain for two or three hours, when you can clean it off.

SMALTS.

I would recommend you to make your own smalts, You can do it at a cost of about one cent a pound. Any good, fine sand will do. See that it is clean, put ½ gallon sand in a kettle, heat it hot; keep stirring until it is dry, then put in about 2 ozs. of mixed color—the color that you wish—(the color should be mixed in good BO)—keep stirring until all the sand is colored even, then spread it out in the sun to dry, stir it up occasionally and it is ready for use. If you wish you can add a small quantity of pulverized glass or glass frosting.

TO SILVER ON GLASS.

1. Dissolve 12 grains of RS in boiling water; then add, while boiling, 16 grains of NS, having been previously dissolved in one ounce of water; continue the boiling for ten minutes; then add water to make 12 ounces.

2. Dissolve 1 ounce of NS in 10 ounces of water; then add liquor ammonia until the brown precipitate is nearly, but not quite dissolved; then add 1 ounce alcohol and sufficient water to make 12 ounces.

To silver, take equal parts of Nos. 1 and 2, mix thoroughly, then pour upon the glass in the same manner the photographer applies his solutions, or it may be applied with a brush. It should be applied to the glass while its surface is wet, and should previously be carefully cleaned with soda and rinsed down with clean water. Distilled water should be used for making the solutions. About two drachms of each will silver a plate two inches square. The solution should stand and settle for two or three days before being used; it will keep a long time.

EMBOSSING BY BRUSHING OUT ON GLASS.

On the flashing side of the glass, or any side if plain glass, lay a coating of asphaltum mixed with a little red lead. When dry place the stencil plate on the glass, and with the use of a stencil brush rub a little soap upon the edges of the stencil plate. This will make the stencil air tight and prevent the TT [which is afterwards used] getting under the edges of the plate and leaving a ragged outline. With a similar brush dipped in TT rub off the asphaltum, lift off the stencil and wash away the deposit left by the soap and TT in *cold water*. It is now ready for the acid [fluoric acid] to "bite off," when the ornament will have a sharp, clean outline like the stencil. Add 4 ozs. of vitriol to 1 pint of acid.

BEST IMITATION OF ETCHING.

Grind sugar of lead in damar varnish with TT to the consistency of cream. Write the word or ornament on the glass, and when set or nearly dry go over with dark gold bronze; when thoroughly dry back with light.

A very pretty sign on glass is got by blending the letters with copper, gold and silver bronzes, and back with some rich color.

FLUORIC ACID—HOW TO MAKE IT FOR ETCHING,

Fluoric [sometimes called hydrofluoric] acid can be made by the fluor or Derbyshire spar, pulverizing it and putting it into sulphuric acid, which will eat or dissolve it.

Druggists do not generally keep this acid, but can get it in the principle cities. It costs about 75 cents per ounce, which will be sufficient to do about $50 worth of work. It is put up in gutta-percha or lead bottles, and must be kept in them when not in use. Glass bottles, of course will not hold it, as it will dissolve the glass.

Glass-Grinding for Transoms, Side Lights, Etc.

After you have etched the design and wish to show it off to better advantage, take a flat piece of brass and flour of emery and keep it wet. You can grind the light in a very short time. Be sure the glass is laid flat on a level table.

PREPARATION FOR SHEET ZINC.

The sign painter is often called upon to paint a sign on sheet zinc, and when this sign is exposed to the weather a length of time the paint frequently peels off, especially when ground with white lead. I would recommend the following wash to make the paint adhere:

2 parts chloride of copper,
1 part nitrate of copper,
1 part sal amoniac,
1 part hydrochlorac acid.

Mix in 75 parts water and apply to the zinc a day before the paint is applied.

The above mixture can be kept ready for use for any length of time by keeping it well corked in a bottle. Shake it well before using.

JAPAN SIGNS.

These signs, in various sizes, are playing a great part in sign painting, and when properly executed they make neat and pretty signs. But so few workmen will study how to avoid certain difficulties attending the execution of a neat tin sign.

For instance, in laying off, they will either use a lead pencil and make indelible marks, or [as I have see an old sign painter do], use a piece of wire or needle and scratch the japanning completely off the tin, causing the same to rust, and giving the whole sign an old and dingy appearance shortly after exposure to the weather; others draw patterns on pa-

per, chalk the back of the paper, and trace it on their tin by means of a pencil or sharpened piece of wood; this mode is too tedious. It requires about the ssme time to lay off the sign that it should to have it sized in, and ready for gilding.

In my experience I have found the following mode the most practical and expedient, as it leaves the sign without mark or scratch to mar its appearance.

Take your tin, clean it well with soft cotton, then take the chalk crayon, lay off your sign, and if the chalk will leave some heavy marks on some places, take a Badger hair blender and dust the whole off again; your tin will then be ready for sizing. To mix your size, take 2 ounces of English wearing body, and 2 ounces of American rubbing varnish, add ¼ ounce of fat oil and enough yellow to give it body. Size in the evening and gild in the morning.

The size mixed in this way will not run into the chalk crayon marks, but will make a neat and sharp edge of your lettering, and a harder surface than oil size. The chalk marks will disappear by cleaning your gold entirely, and no mark of any kind remain.

CREEPING.

Grounds that have stood for some time, especially in cold weather, the paint is very apt to crawl on it.

To prevent it various modes have been adopted, such as rubbing with a wet cloth, breathing on it, etc., all of which takes the time of the workman. I find that the best remedy is adding a few drops of

spirits of ammonia to the color. Be very careful not to get in too much or it will destroy the paint.

SIZE FOR CANVAS.

Use common glue size for all ordinary work, but for clear white transparencies, use white wax dissolved in TT. Sometimes starch is used with good effect.

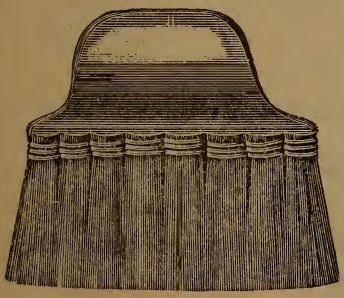
LETTERING ON CANVAS.

The color should be mixed with copal varnish or hard oil varnish. No oil should be used. Short hair badger fitches are the best brushes to use on muslin work. Bristle brushes for coarse canvas.

PAPER HANGING.

TOOLS.

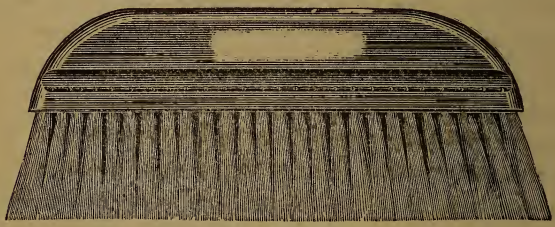
There is no branch of the business where there has been more improvement in the way of tools than in paper hanging. In years gone by the tools of the trade were very few and simple. A white-wash brush for pasting, shears for trimming, a towel for rubbing down, and the kitchen table for the paste board. At the present time the object is to get on as many bolts of paper in a day as possible, and have the days work to look well, but no man can paper a room at the prices that are now being paid, and make wages unless he is supplied with the modern tools to do the work with; and for the benefit of uninitiated we will give a description of the tools now in use, and how they are used.



PASTE BRUSH.

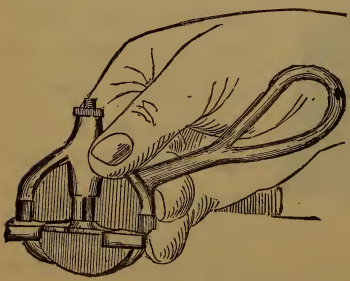
PASTE BRUSH.—The brush has long bristles and when dipped into the paste will hold up enough paste to do a strip about nine feet long with the one dipping. The object of this is to paste the strip as soon as possible and then get it on the wall before the paste has time to strike

through the paper. The pasting should never be done until you have every thing ready to hang the strip. A strip of brown blank or thin white should be put on the wall as soon as they are pasted. A short bristle brush will not flow on the paste properly.



RUBBING DOWN BRUSH.

RUBBING DOWN BRUSH.—This is a very useful brush to the paper hanger and should be well taken care of. Always wash it out when through of an evening.



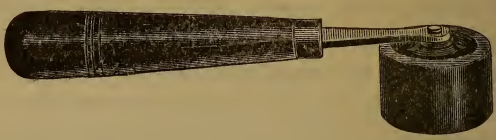
TRIMMER.

TRIMMER. — This is indispensable for good work. All fine paper should be trimmed on both edges and butted. To use the trimmer, paste the strip and fold each end about half way, so that each end will meet in the centre, being

careful that the fold is a true one. Lay the straight edge on the line that is to be trimmed and roll the trimmer along the edge with a steady movement. A strip of zinc about four inches wide and the length of your straight edge should be fastened to the paste board for the knife to roll upon. A shoe knife is sometimes used for trimming but does not do good work.

APRON.—Should be made of good heavy bed ticking. The apron should come well up under the chin so as to protect your shirt front; and down a little below the knees. A large pocket in front a little above the waistband of your pants; this is for the rubbing-down brush and roller. A strong loop should be sewed on just below the right hip, for the scissors. A pocket should also be on the left side for the two foot rule. A shoe knife is sometimes carried in the large pocket for trimming around frames and base.

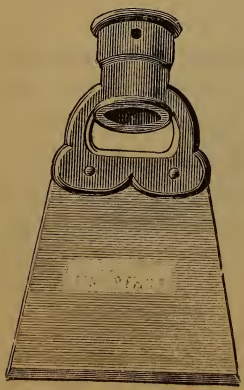
PASTE BOARD.—One of the most important tools of the paper hanger. There are such a large variety of them that we will not attempt a description of them in our limited space. We will state however that the main object to be attained in the construction of the paste-board is to get them into as compact space as possible.



ROLLER.—This tool is used to roll down the edges. In using this tool you avoid soiling the edge of the paper and get all parts down to the wall, and should be used on all good work.

CHALK LINE, — Plumb-bob, rule, shears, edging knife and the scrapper about completes the list of tools for the first-class paper hanger, except the

TOOL BOX.—No first-class paper hanger will do without the tool box. This is made of light but durable material, about 14 inches in length and 8 by 8 inches in height and width, with a handle on the top so that it can be carried the same as a valise. Each owner will paint and decorate his tool box according to his fancy. All the small tools are kept in the box.



CLEANING THE WALL. — To clean off old paper, wet it thoroughly first. You can not get it too wet. If there is more than one coat of paper on the wall, go over the entire room with water then give it another coat, beginning at the first starting point. You will save time by letting each coat rest before applying another. It

is sometimes necessary to go over the room with the wetting four or five times before it is soaked through to the wall. When it is soaked through use the wall scraper. The handle should be about two feet long. If the paper is well soaked it will peel right off.

TO PAPER A ROOM.

Hang the ceiling first always. If you are not an expert, it is best to snap a line, distance from the angle of the ceiling and side wall, one half inch less than the width of the paper you wish to hang. Hang to this line thus leaving one-half inch of the entire strip to lap on the side wall. The ends should also be trimmed to lap on the side walls one half inch. One-half inch is sufficient, as a wider lap sometimes shows through a delicate border. If you succeed in getting the first piece on straight, you will have no trouble with the others.

Trim the paper close to the pattern on one side and measure the length of the strip required; lay the roll on the right hand end of the paste board; pick the figures that you wish to work by, then cut through it, unroll to the left and cut through the same figure at the end of each strip. After cutting a sufficient number of strips for the room, turn the paper over with the blank side up, get the paper even on the board with the untrimmed side on the side of the board that you wish to stand while pasting and about two inches from the edge of the board. Slip the top strip over to the edge of the board and commence pasting on the right, holding the paper in

its place with the left hand. Fold the ends over until they meet in the middle. Commence in the corner or in the most convenient out-of-the-way place where the lap will not show. A strip of paper when pasted should be put on the wall as soon as possible. In hanging the finer grades of paper you should trim after the strip is pasted. Avoid getting paste on the hands; keep all your tools clean.

In hanging on the ceiling it is best to have a roll in the left hand to keep the paper out flat. Some paper hangers have a piece of broom handle or some other round stick of wood just the width of the paper in length. A light roll of paper will do as well, and I think better, because it is more convenient to get. Paste the end down on the roll so as to have a smooth face. Hold the roll in the left hand in the center of the strip, then peal the end down and with the right hand place the end of the strip on the ceiling in its proper place, and with the left hand guide to a proper match, holding the roll square with the edge. If the strip is started at a proper match there will be no trouble to run it on. Slide the roll along the strip holding it square so as to keep the wrinkles out.

The side wall paper should be started at the side of a door or window frame that is out of the way of a miss-match. If there is a square top base, it is a good idea to trim the paper to fit with a knife; the knife will also be found handy in trimming around frames. A continuous match over and under window frames is not always necessary and is sometimes

left until the last. I think that it is best to finish up all as you go.

PASTE FOR PAPER HANGING.

Good sound wheat flour should be used if you wish good paste. I have never seen any substitute used with any success.

No. 1. Is generally used and will answer for most paper. The quantity for about one day's work is as follows: beat up four pounds of good white wheat flour in cold water—enough to form a stiff batter, beat it well to take out all the lumps, have it about as thin as batter. Have boiling water ready and pour it gently over the batter, stirring rapidly at the same time. Notice when it begins to change to a cream color and commences to swell, then stop pouring, as it is done. Paste should stand at least ten hours before using. Do not use it while hot. Let it stand for about one hour, then put about a pint of water over it to keep it from skinning over the top. Do not make any more than you wish for the present job. You will find that there is no economy in making a large lot, unless it can be used in the next two or three days.

No. 2. The same as No. 1, except add about three ounces of A. N.

No. 3. This paste is seldom required, unless you have a very bad wall—one that has been whitewashed a number of times. Mix the same as in No. 1, add about two ounces of K. N. dissolved in boiling water, also one ounce of S. L. Carbolic acid will keep paste from souring, also, common salt.

SIZING FOR WALLS.

The walls should be thoroughly cleaned and all the cracks and holes filled with plaster of Paris before they are sized. The size is weak glue water, the strength according to the condition of the wall. In making the size, let the glue soak over night in cold water and add hot water until all is dissolved. Where the walls have been white-washed it is some times advisable to size with vinegar diluted with water according to the condition of the wall. The acid of the vinegar will counteract the alkali in the lime.

TO PUT ON LINCRUSTA WALTON.

One-third glue and two-thirds paste worked as warm as you can work it, also very thick. Rub down the same as paper.

SIZE FOR PAPER.

The size for paper that is to be varnished should be made of good clear white glue and add about one-third corn starch. Do not attempt to put it on until it is cooled off or chilled. It should be worked very quick. Work the size free from the brush and do as little rubbing as possible. Avoid runs.

FRESCO OR DISTEMPER PAINTING.

The carbonate of lime or whiting employed as a basis is less active than pure lime of fresco. The vehicles of both modes are the same and their practice is often combined in the same work. Water is

the common vehicle, and to give adhesion to the tints and colors in distemper painting and make them keep their place, they are variously mixed with the size of glue. Too much of the glue disposes the painting to crack and peel from ground, while with too little it is friable and deficient of strength. In some cases the glue may be abated or altogether dispensed with, by employing plaster of Paris sufficiently diluted and worked into colors, by which they will acquire a good surface and keep their place in the dry with the strength of fresco, and without being liable to mildew, to which animal glue is disposed and to which milk and other vehicles recommended in this mode are subject. Of more difficult introduction in these modes of painting is beeswax, although it has been employed successfully in each of them, and in the encaustic of the ancients who finished their work therein by heating the surface of the painting till the wax melted. That would be rather a slow process for the present day.

Never work the color while warm, and do not dissolve the glue by means of heat if it can be avoided. The brushes for this class of work should be first-class long bristle brushes. The stencil is very extensively used in this class of work; hand work according to the prices now paid does not pay. It is so now that anyone that can draw a straight line and has a set of stencils—that person is a fresco painter.

POUNCE PATTERNS FOR WALLS, CEILINGS, &C.

For pounce, medium heavy roll drawing paper is the best for ceiling, or where the pounce pattern is to be large, any kind of thin tough paper will answer.

TOOLS.—The straight edge, dividers, a few sticks of charcoal (that made from grapevine is considered the best,) and a medium grade lead pencil, comprise the tools for sketching.

With the straight edge first draw two center lines at right angles across the paper, then on one side of center line, sketch in one half of the scroll or ornament, in a bold, free, off-hand manner with charcoal. Trace these lines carefully with lead pencil, correct all curves or angles where necessary, and dust off the charcoal. If the design proves satisfactory retrace the pencil marks with charcoal and fold the sheet inward on the center line; rub the paper on the back lightly and you have a faint outline of the other half of the design, which may be speedily completed with the lead pencil.

Now do not grasp an old blunt pin and punch away at the design until it resembles a porous plaster, but procure a slim, sharp needle, and shape a piece of soft wood about the size and shape of a sharpened lead pencil for a handle. By placing the point of the needle against some hard wood the needle can easily be pressed into the handle. You can save enough time in pricking one good sized pattern to make a tool of this description, and with proper usage it will last a lifetime.

Pricking the pattern is an awkward job if held in the hands, and good work is rarely accomplished in that way. To do it neatly and easily, spread the pattern on a smooth cloth cushion; but as cushions are unusual furniture for the paint shop and not always convenient to get, take the next best thing you can get hold of, which may be a woolen jacket or even an old pair of overalls rolled into a suitable bundle.

If the needle be driven straight through into the cloth, it makes a clean-cut hole and the pattern will work equally well from the bottom side. Whiting tied up in some coarse thin cloth is most commonly used for a pounce bag, but for a light ground work, use powdered charcoal.

A tracing wheel that pricks twelve holes to the inch, with long slim teeth is the best, and may be procured of any dealer in saddlery hardware. A smooth soft-wood board is the best to prick on. Unfold the paper after pricking and lightly sand-paper the reverse side to remove the raised portion, forced through by the teeth of the wheel, which, if neglected will obstruct the holes. Pounce with whiting. Rose pink is suitable for light colors.

STENCIL PATTERNS.

For stencil patterns use linen tracing cloth. The design may be drawn with lead pencil, and with good taste and judgment the ties may be so placed as to require no touching up or connecting. Cut on glass with a sharp penknife held perpendicularly, or

nearly so; This done, give two coats of shellac on each side and you will have a pattern that will last a long time. It should be carefully cleaned after using.

The paint to be used should be made quite thick and sufficient oil used to prevent setting too quickly. Spread a small quantity of the color on a palette or board and rub the brush several times over it. Care must be taken not to get to much color in the brush as it will press under the edges of the pattern and make an unsightly blot. Small patterns may be held in position with one hand, but larger ones will require to be fastened with a couple of needles or fine tacks. With a little practice, the most beautiful clear-cut designs can be executed and several colors employed.

A good working gold-size for stenciling is made of English varnish and japan gold size thickened with tube chrome yellow. Equally clean work may be done with it as with paint. After this becomes tacky apply either gold leaf or bronze in the usual way. (See article on gilding.) After using the brush, wash with benzine or turpentine and afterwards with soap suds and rinse with clear water and it is ready for use again. All colors for stenciling should be mixed with about as much turpentine as oil, and can be used very sparingly. A common mistake with the uninitiated is using the color too freely, which causes blots and ragged edges. To overcome this difficulty, I would recommend giving the brush a few brisk rubs on a piece of board after it has been dipped in the color and before it is applied to the work. This will distribute the color evenly on the brush or roller

and give uniformity of color and clear cut edges to the finished ornament.

Much can be said of the stencil, as it now enters largely into almost all classes of decoration. We will mention some that may be of advantage. A border around a sign, a border around a banner, display sign, an ingrain paper, ceiling decorated with corners, extension mould and center, also border on the side wall. The same for a painted wall. A neat pattern for glass frosting for Halls, Churches &c., a roseatte in the panel of the cornice of a large house. A roseatte at the cap of outside window and door frames, panel of a wagon, panel of a door, &c.

If you wish patterns write to R. C. Miller & Co., Xenia, Ohio, and you can get them at reasonable rates.

CARRIAGE PAINTING.

The main object to be attained is to get a good foundation to work upon. In working rough stuff carriage painters get too much oil in it, and it does not dry; and when they go to rub it down, it rolls up.

The methods of mixing rough stuff are as various, almost, as the faces of the painters who are required to mix it. The chief requisite is to select certain coarse gritty pigments, such as yellow orche, French umber or English filling. Whatever paint is selected, it is of vital importance that the paint should be ground exceedingly fine. The liquids required are confined to Japan, oil, turpentine and varnish, and they must be selected and proportioned according to

the time allowed for the rough stuff to harden. Japan hastens, and oil retards the drying. The following receipts have been tested and are known to be good.

1. English filling, 5 lbs.; keg lead, 1 lb.; mixed into a stiff paste with equal parts of either gold size or best brown japan, and three day rubbing varnish; add a gill of raw oil.

2. Yellow ochre or French umber, 5 lbs.; keg lead, 1½lbs.; mix stiff with japan and add a gill of raw oil, and half a pint of the bottoms of wearing varnish.

3. Burnt umber, 3 parts, silica, 2 parts, yellow ochre 1 part; mix stiff in either brown japan or gold size, and bottoms of wearing body varnish.

The above receipts produce tough, durable coatings, but for lightning dryers, omit the oil and oil lead.

The carriage painter will save labor by using clean color varnish and brushes; always strain your color before using; never mix more than is sufficient for immediate use; never draw from the can more varnish than is necessary, and if you have any left do not put it back in the can without straining.

The methods of doing work of this class are various. I will endeavor to explain my method. First clean off the work; get it free from grease and dust; rub down all rough places; and then give it a good coat of rough stuff; let it get dry. Then plaster it well with putty, which is made as follows: If it is an old job, or new, and you have but little time; use SP

mixed into a stiff paste with rubbing varnish, with a little good japan, (use no oil). When dry cut it down with sandpaper, then flow on two coats of flat color, the last coat with a little rubbing varnish in it; then cut it down with PS; then coat with rubbing varnish with very little color in it; then cut all down until it is level, when it is ready for striping, then flow on the finishing varnish.

A quick way to do an old job that has a good body but is dull and cracked, is as follows, take salts of ammonia dissolved in water and wet the parts to be cleaned with it, and cut down with lump PS until you are through the varnish. If the ammonia is strong enough, you can peal it off with the putty knife. The ammonia will have no effect only on the varnish, and will not effect the body color, after the job is cleaned, care should be taken to wash all the ammonia off of the job, with water. When dry, plaster bare spots, holes, &c., then cut this down when dry enough, coat with Flat Black, then color and varnish. Then hair down and coat with finishing varnish. A job done in this manner can be done in five days. This method we do not recommend only where persons will have cheap work done, and if they will have it, it stands you in hand to give it to them, if you don't, some one else will.

TO MIXING STRIPING COLORS.

Take one part rubbing varnish, two parts finishing varnish, and one part turpentine. Bottle it up, shake it well, and set away for a few days.

With the exception of the lakes, which are slow dryers, this vehicle will dry as quickly as any mixture that can be produced, with advantage also of free working color. For carmine and lake, add a few drops of japan to the quantity of vehicle required to mix the color. During the summer season when the painter is daily called upon to perform miracles almost in "rushing out" work, the above mixture will be found far superior to the usual one of japan and turpentine, where tube colors in oil are used.

Quick color should be kept in small pans of tin and stoneware, rather than in a tough mass on a palette board to be worked down with the pencil. Grind the color to about the consistency required and keep in a seperate pan, turpentine, containing a small proportion of varnish or japan. By this plan, dryer is added to each fresh pencilful of color, the pencil behaves better and the stripes run on as freely and with as good edges as when color is mixed with oil. Last, but not least, the color is not so liable to "wash-up" when japan and turpentine are employed.

KALSOMINING.

Kalsomining—or, as it is sometimes written "calcimining"—is, after all, but a high-sounding name for painting walls in *distemper*, "distemper" itself being a corruption of the French word *detrempe*—or *soaked*, in plain English.

Distemper painting produces very beautiful effects on walls and ceilings, the tones having a certain peculiar softness that it is impossible to imitate with oil colors even when flatted. Wall paper owes its principal beauty to the fact that it is printed in water colors or distemper.

To do a good job in kalsomining the wall must be in good condition to receive the application of the water paint. Few walls are generally in the right condition. Finger-marks or grease will show through the work when finished if they are not killed out. Fly-specks like-wise will prove troublesome unless removed. Old kalsomine must be removed by washing. To do this is easy enough if you will follow the method mentioned below: Take a pail of warm water and sponge; soak the latter, squeezing out most of the water, then procede to wipe the wall down to the plaster-of-paris finish. By keeping your sponge rather dry you need never drop any water on the floor. Have another pail, in which you can occasionally clean your sponge. Always commence by wiping off the ceiling first,

then the top of side walls, and last the bottom of these. Those trying this method of cleaning off old work will never return to the old dirty, dusty scraping so much in vogue in many places. If there be any cracks or breaks in the walls, they should carefully be stopped with a mixture of plaster-of-paris and lime. By adding a little glue-water to the mortar, it will not set so quickly, and will give the workman more time properly to finish his patching. We would urge the necessity of using the best brushes attainable, as it is impossible properly to do a job with poor tools.

"If the walls are old ones that have been whitewashed, dissolve about one pound of potash in about three-quarters of a pail of water, and with an old brush wet the old lime; then with a wide putty-knife or scraper you can take the old lime off and leave the surface in a condition to receive the kalsomining. Any defects, such as breaks or old nail holes must be repaired with freshly mixed plaster-of-paris and a little slacked lime. For a first-class job in white or hard-finished walls, use French zinc, or for common work, Spanish whiting. The quantity of sizing to be used is as follows: One pound of the best white fish-glue, well cooked, to twenty pounds of material."

A good method of preparing the kalsomine is to slake or soak it over night, after having well stirred it; the next morning, or when needed, add to it the glue, first dissolved in warm water, bringing it to the appearance of milk, and so that when applied to the wall it does not clot or appear as if oily. If the former

effect is noticed, there is not enough water; if the latter, there is too much water. When of the proper consistency, dissolve through a rag bag, some ultramarine blue. This only when using whiting; the zinc does not need it. For a pure white wall, the French zinc is the best. If put on the walls properly, it will have a gloss that cannot be secured with any other material.

For kalsomining in tints, use distemper colors. They can be bought already ground. Distemper colors are colors ground in water, without any size. It is best to try your mixture on a shingle, and after it is dry you will know if it has just enough size and is of the proper shade. When applying, begin by doing the outside of the molding on the ceiling, if there is any, then the center piece, and proceed by applying the mixture with a regular kalsomining brush. Do not allow your kalsomine to dry on you, but go quickly from one end of the ceiling to the other, working with the tips of the brush and always working up with the new what has already been done on the lap.

There are other methods of doing the work, also in the mixture. We give the following which may be of interest.

CALSOMINE FINISH.

Take 10 lbs. PW, or gilders' whiting, best quality, add boiling water and stir until the liquid appears like thick milk, now mix in liquid G one-half pound, a good clean quality, stir it thoroughly. You must

add hot water in sufficient quantities to make the liquid flow freely from your brush; while applying stir well. Calsomine will not work smooth if too much G is added and is liable to crack. When applying your calsomine dip the brush often and only deep enough to take so much as the hair will retain, and spread on a light, good covering coat.

Soak the G over night, one-half pound to 2 quarts water, set the vessel in a kettle of boiling water to cook properly without scorching; when dissolved add another quart of water to it. A good calsomine or white-wash brush is necessary to produce good work.

The best and finest work done in calsomine is done with WZ, white with water or G sizing, the surface to be applied to be clean and smooth. For the walls use one pound of fine white G to fourteen pounds WZ. Dissolve the G by placing the G pail in boiling water. After you have mixed your WZ with enough warm water to render it the consistency of cream, or a little thicker, it must flow freely from the brush, and is only necessary to have a body sufficient to cover with an even finish. A good calsomining brush is indispensible for good work. Coloring matter can be added and a desired tint obtained, making in many cases a beautiful satin-like finish. The WZ in itself renders a fine finish but care must be observed in applying it; have everything about, clean and free from dust. Do not attempt to work calsomine while warm.

KALSOMINE.

Whiting 4 lbs., glue 2 lbs. Stand the glue in water over night, mix the whiting with cold water and heat the glue until dissolved and pour it into the other, hot. Make of proper consistence to apply with a common white-wash brush.

KALSOMINE, AGAIN.

PW 6 lbs., WZ 3 lbs.; glue, 6 ozs. Stand the glue in water over night, or until the glue is dissolved. Do not warm the glue if you can avoid it, but if necessary to save time do not work it while it is warm—put in a lump of ice so as to chill it. This can be made any desired shade or tint by adding any pigment, so that they are fine. Do not put in the glue size until all the pigments are well broken with water.

LIME FOR KALSOMINING.

½ bushel CC, 1 lb. SC, ½ lb. ZS, 1 gallon of SW. For brick work exposed to damp, the following will be found to work well: ¼ peck of fresh well burnt CC with SW sufficient to make thin paste, run through strainer, add 1 lb. SO, which has been dissolved in boiling water; make a thin paste of 1 lb. of RF, ¼ lb. G, mix with the compound while hot, add ¼ lb. of SA dissolved in water, stir all together, and let stand for one week, or longer.

The following can be more easily prepared, and is very good:

Take ½ bushel of CC, and put it in a kettle, put

water in to make a thick paste, add 1 gallon RO, boil well for one hour. Then let it stand over night, or the longer it stands the better. When you wish to use it, take out enough for your job, add glue size enough to give it a body, and also coloring matter to give it any desired tint; apply with kalsomine brush.

FILLERS.

WOOD FILLING.

1 lb. CS, ½ pt. BO, ½ pt. Japan, ½ lb. PS, 1 gill SH varnish; mix well together. For dark wood add a very little burnt umber; thin with B or TT; apply with a stiff brush; let it stand until it sets; rub off with excelsior shavings or rags; get all out of the corners with sticks or putty knife.

I have used this filler for a number of years and can recommend it to the trade. For light woods use more SH varnish and less Japan, unless your Japan is very good.

A FILLER FOR POROUS HARD WOODS.

Use good BO and CS stirred into a very thick paste, add a little Japan then reduce with TT. For dark ash and chestnut, use a little raw sienna; For walnut, burnt umber and a slight amount of Venetian red; for bay wood, burnt sienna. In no case use more color than is required to overcome the white appearance of the starch, unless you wish to

stain the wood. This filler is worked with brush and rags in the usual manner.

Let it dry for 48 hours, or until it is in condition to rub down with No. o sandpaper without much gumming up, and if an extra fine finish is desired fill again with the same materials, using less oil but more Japan and TT. The second coat will not shrink, it being supported by the first coat. When the second coat is hard, the wood is ready for finishing up in any desired style or to any degree of nicety, by following up the usual methods. This formula is not intended for rosewood and will not be satisfactory if used therefor.

A GOOD FILLER.

2 qts. TT, 1 qt. BO, ½ pt. Japan, 1½ lbs. PS pulverized, 3 lbs. PW, 1 lb. French yellow, 2 lbs. plaster Paris, 1 lb. LRG. This filler is worked with brush, rags and excelsior shavings in the usual manner. It must be worked quick, as it sets fast. For dark woods add a small quantity of burnt umber and B sienna.

A CHEAP FILLER.

If you have a job that you have to put through in a short time, make a strong size out of common G and common starch, half and half; dust off the work well and size, and when dry rub down with sandpaper; dust off again and it is ready for either paint or varnish. Before coating over this filler be

sure that it is good and dry. A damp day will not do to use it.

PUTTY.

For ordinary varnished wood must be mixed with a little oil and Japan; also add some rubbing varnish. Have it so that it will dry quick. Color it to match the wood. For pine, chrome yellow, burnt sienna and whiting. Ash,—use the same, except add a little burnt umber. White walnut — use the same. Black Walnut — whiting, burnt umber and black. In using the putty be careful to clean off all the surplus from around the outside; do it with sandpaper or a rag dipped in turps.

PUTTY FOR WOOD THAT IS TO BE VARNISHED.

For puttying inside work, take ½ SW, ¼ beeswax, ¼ RN; powder the RN very fine, mix it with the SW, then melt the beeswax in ½ oil and ½ TT; put all together in an old sauce pan and heat gradually, stirring and mix in color. For walnut, match with burnt umber and burnt sienna or venetian red; for light woods but little, if any color beside the ingredients. After thoroughly heated and mixed take off and let cool, enough to thicken up for working on a board oiled or covered with whiting; work it into rolls about an inch in diameter. In using, have a candle or lamp and a round pointed knife; heat the knife and fill the holes quickly, leaving hole round full; rub off with a bit of sandpaper. After an hour or two this putty will match the wood perfectly

and will never swell nor shrink, and after a little practice the work can be done just as quick as with ordinary putty. If you are hurried for time and are obliged to use shellac, use white shellac; this leaves the wood clear and does not have that nasty, sickly look as when brown shellac is used.

SLATING FOR BLACKBOARDS.

There are quite a number of ways of doing this class of work. I find that the great secret in putting up a good blackboard is to use no oil of any description in any of the coats. If it is a plastered wall or board you wish to slate, first give it a coat of G size, then rub it down lightly with fine sandpaper; then give it a coat of SH varnish and LP enough to give it a fair body. If on wood omit the sizing but use paint for priming. Then give two coats of either of the following:

First. 2 quarts AC, ½ lb. SH, 1½ drachms LP, 20 drachms UB, 6 ozs. powdered PS.

Second. 1 gallon AC, 1 lb SH, ½ lb. IB, 5 ozs. EF, 4 ozs. UB.

Third. Take equal parts of PS and LR and grind them in a mixture of TT and best VS; add enough LP to make a dark color, then thin with TT until it is perfectly flat. Apply with a brush and blend over.

Fourth. 1 gallon WN, 1 lb. SH, 4 ozs. LP, 4

ozs. UB, 1½ lbs. SP, 2 ozs. PS and powdered emery. The WN is cheaper than AC and does as well.

Fifth. 1 gallon SH varnish, 4 lbs. black M, 2 lbs. SP.

All the above must be kept well stirred while using them, and when you are through put up what you have left in a bottle and cork it up, and it will keep for a long time. If at any time the slating is too thick, thin with AC.

DRYERS.

HOW TO MAKE AND HOW TO USE THEM.

With respect to drying the well-known additions of sugar of lead, litharge and sulphate of zinc, either mechanically ground or in solution for light colors, and japanners gold size or oils boiled upon litharge for lakes, or in some cases, verdigris and manganese for dark colors, may be resorted to when the colors or vehicles are not of themselves sufficiently good dryers alone, but it requires attention, as an excess of dryers renders oils saponaceous, is inimical to drying and injures the premanent texture of the work. Such colors, however, dry badly from not being sufficiently edulcorated or washed, and many are improved in drying by passing through the fire or by age. Sulphate of zinc as a dryer is less efficient than the acetate of zinc, but is to be preferred with some colors. It is supposed, erroneously, to set the

colors running, which is positively not the case, though it will not retain those disposed to it, because it lacks the property which the acetate possesses of gelatinizing the mixture of oil and varnish. These two dryers should not be employed together, as frequently, directed as chemical action takes place and the two new substances are formed, one of which, is perfectly insoluble, and the other poor in its drying properties. The state of the weather and atmosphere, exert a great influence upon the drying of paints, oils, etc. The oxygenating power of the direct rays of the sun renders them peculiarly active in drying oils and colors, and was probably resorted to before dryers were thought of. The atmosphere too, is imbued with the active matter to which its drying power may be attributed. The ground may also advance or retard drying, because some pigments, united either by mixing or glazing, are either promoted or obstructed by their conjunction. Artificial heat also plays an important part.

The various affinities of pigments occasion each to have its more or less appropriate dryer and it would be a matter of useful experience if the habits of every pigment in this respect were ascertained. Dryers of less power than the above, such as the acetate of copper, *massicot*, red lead, and the oxide of manganese, to which umber and the cappagh browns owe their drying qualities, and others might come into use in particular cases. Many other accidental circumstances may also effect drying. Dryers should be added to pigments only at the time of

using them, because they exercise their drying properties while chemically combining with the oils employed, during which the latter becomes thick or fatten, and render additional oil and dryer necessary when again used. Acetate of lead dissolved in water, spirits of turpentine, may be used as a dryer of oil paints with convenience and advantage in some cases. In the employment of dryers it will be necessary to guard against the following :

[a] Not to add dryers to those pigments which dry well of themselves.

[b] Not to employ them in excess, which only retards the drying.

[c] Not to add them till the color is to be used.

[d] Make use of only one kind at a time.

[e] Impurity of the pigments sometimes retards drying, in which case it should be washed. Another point should be observed and that is, that one coat of paint should be thoroughly dry before another is applied, for if the upper surface of paint dry before the surface beneath, it will shrivel by the expansion and contraction of the under surface as the oil evaporates and dries. Overloading with paint will be attended with the same evil, and if the upper surface be of hard or brittle varnish, cracking of the paint will be the result. Always avoid using old fat paint that is to be varnished over, and always put your dryer into your paint before breaking up or thinning.

DRYING PROPERTY OF LINSEED OIL.

The activity (drying power) of pure linseed oil is represented—according to M. Chevreul — by 1,985, and oil treated by manganese with an activity of 4,719, yet when they are mixed the sum of the activities (drying powers) will be 30,828. There are substances which increase the drying property of pure linseed oil, and others which seem to retard the drying. Experiments made by M. Chevreul elicited the following facts, namely:

"Linseed oil with one coat applied upon glass was dry after 17 days."

"The same oil mixed with oxide of antimony, took 26 days to dry. In this case the oxide of antimony was an *anti-dryer*."

"Linseed oil mixed with oxide of antimony, and applied upon a cloth painted with pure white lead, was dry after 14 days."

"The same oil mixed with the arseniate of protoxide of tin was not hard after 60 days."

"Oak wood appears to possess the anti-drying property to a high degree; poplar to be less anti-drying than oak, and Norway fir less than poplar."

"Experiments proved that a first coat of linseed oil on oak was dry only on the surface after 32 days; and three coats took 159 days to dry."

"Three coats on poplar wood dried in 27 days, and on Norway fir in 23 days."

"One coat of linseed oil given upon surfaces of copper, brass, zinc, iron, porcelain and glass, was dry in every case after 48 hours."

M. Chevreul believed that a substance may be drying or anti-drying under different circumstances. He claims that metallic lead is drying towards pure linseed oil; and white lead which is well known as possessing drying properties, is anti-drying towards linseed oil applied upon metalic lead.

JAPAN DRYER—BEST QUALITY.

RO 1 gallon, and put into 3-4 lb. SH, 1-2 lb. LRG, 1-2 lb. LR, 6 ozs. SL. Boil in the RO until all are dissolved, which will require about 4 hours; remove from the fire, and when very near cool add 1 gallon TT, and stir it up well, then it is done. B can be substituted for TT if you wish.

JAPAN DRYER, NO. 1.

RO 1 gallon, 3-4 lb. SH, 2 lbs. M, 1 lb. ZS. Boil about 4 hours, and when very near cool add 1½ gallon B.

JAPAN DRYER, NO. 2.

9 gallons of RO, 10 lbs. LRG, 10 lbs. LR, 7 lbs. black oxide of M. Boil all together; then add 30 lbs. Kowery gum, and when near cool add 35 gallons TT. This is a good dryer and can be depended upon.

VARNISHES.

In the proper manipulation of varnish, lies, to a considerable degree, the secret of its presenting fullness and brilliancy. The same make of varnish applied by two different methods of brushing will often present so great a difference in beauty as to give the impression that one body was finished with an A No. 1 grade, while the other will appear to be quite the opposite. Finishers, who flow on heavy coats of varnish and spread it over a considerable space before they level it up, as a rule, produce the best work, and are the least liable to lay in complaints about seediness, brush marks and runs. Cleaning off the work before varnishing is an item of importance.

CAUTION RESPECTING THE MAKING OF VARNISH.

As heat in many cases is necessary to dissolve the gums used, the best way when practicable, is to use a sand bath, which is simply placing the vessel containing the varnish in another filled with sand and place on the fire.

COMMON OIL VARNISH.

RN 3 lbs., drying oil, ½ gal. Melt together, and add, when removed from the fire, 2 quarts of warm oil of TT.

COMMON TURPENTINE VARNISH.

This is merely clear pale RN dissolved in oil of TT, usually 5 lbs. of RN to 7 lbs. of TT. This requires but very little heat.

COPAL VARNISH.

15 lbs. pulverized RN dissolved in one gal. of drying oil, 1 pt. Japan, if the oil does not dry it, 2 gals. B, 1 gal. TT; 1 qt. WN. It will be necessary to heat the drying oil to dissolve the RN. An elastic varnish can be had by adding 3 ozs. of R cut in small pieces and dissolved in RO by warming. See that it is well dissolved, then strain and add to the above.

BODY VARNISH FOR COACH PAINTERS.

Eight pounds of fine gum anime, two gallons of clarified oil, three gallons good turpentine; boil slowly for four hours.

GLOSS VARNISH.

Take 1 gal. RO, boil for one hour, then add 4 lbs. RN, stir till dissolved; add 1 gal. TT, 3 ozs. GC dissolved in one pint of AC.

COMMON VARNISH.

5 lbs. pulverized RN, ½ lb. beeswax, 1⅓ gal. RO, ¼ lb. M. Boil for one hour, thin with TT or B until warm.

DAMAR VARNISH.

One of the difficulties to overcome in making a clear colorless varnish is the milky opacity usually present when dissolving the gum in oil of turpentine. This opacity is owing to moisture being present in the gum, and not certain parts of the gum remaining undissolved, as is commonly supposed. The moisture having first been driven off, a clear, colorless solution results. Many of the imperfections of a poor article are owing to the presence of this same moisture. The cracking is largely owing to this, as little bubbles are often formed, hence the uneven surface. They also cause the varnish to spring. To prove this it is only necessary to procure a small quantity of the best Damar the market affords, add to it one drop of water, and it is at once changed to one of inferior grade. The varnish manufactured by the following process the author found to be colorless, perfectly transparent, dries quickly, a high gloss, and will not crack, peel, or become tacky. The main object is to remove the moisture. This can be done by evaporating a solution of the gum, or drying it first. To do this a porcelain lined kettle is necessary, in which place the gum and heat over a slow fire. Great care must be taken to keep the gum from taking fire. The author's plan has been to have a cover loosely fitting the kettle, its edges or rim covered with cotton having been saturated to a slight degree with water, and the cover suspended by a cord over the kettle. In case of fire it can be lowered at once and the flame extinguished immediately.

In making the varnish, five parts of the gum should be taken to four parts of the oil of TT, or 85 ozs. of the gum to every four gallons of the oil of TT.

MIXTURE OF VARNISHES.

When different varnishes are mixed they should always be allowed to stand for several days before using, to give them time to assimilate.

GOOD, WHITE, HARD VARNISH.

One quart of good AC, 10 ozs. gum sandarach, 2 ozs. gum mastic, ½ oz. gum anime. Dissolve in a clean can or bottle by shaking often until dissolved, and strain.

WHITE, HARD VARNISH.

Dissolve gum anime in nut oil, boil it gently as the gum is added, giving it as much gum as the oil will take up, and while cooling dilute it with pure turpentine; this will do for the ground, also for the japanning for white. It takes some time to harden, but it is durable.

JET BLACK VARNISH.

To make a jet black varnish for small wood handles, that will make them smooth and shining and hard and solid, so that they will not get dim by handling or lose their gloss, take of asphaltum, three ounces; boiled oil four quarts; burnt umber, eight ounces, and enough oil of turpentine to thin. The

three first must be mixed by the aid of heat, and the turpentine gradually added—out of doors and away from fire—before the mixture has cooled. The work dry, is given several coats, each being hardened in a japanner's oven. The last coat may be rubbed down—first with tripoli applied on a soft cloth, then with a few drops of oil.

TRANSPARENT VARNISHES.

The following recipes have been selected from various sources, and to the best of our judgment, but we do not undertake to say that there are no inaccuracies, either of substance or proportion. We believe our selection is a careful one, as we have rejected those which have appeared to us unsuitable either from promising to be bad color or demanding too difficult manipulation. Many of the ingredients appear in different recipes, in conjunction with others and in a different proportion. In making experimental trials, the simplest mixtures should first be selected, and then additions made and their effects noticed. An acquaintance with the values of the component parts will thus be most quickly attained.

SPIRIT VARNISHES.

1. Gum sandarach, 10 oz; gum mastic, 4 oz; camphor, ½ oz.; digest with 24 oz. alcohol, 64 o. p.

2. Gum sandarach, 4 oz.; gum mastic, 8 oz.; opaiba balsam, 4 oz.; white turpentine, 6 oz.;

spirits of turpentine, 8 oz.; alcohol, 5 quarts. Digest at a low heat.

3. Mastic and sandarach each 4 oz.; alcohol 36 oz. When dissolved add 8 oz. Canada balsam, and dissolve it by the help of gentle heat and frequent shaking.

4. Sandarach, 8 oz.; mastic, 4 oz.; Canada balsam, 4 oz.; alcohol, 2 pints. Make as last.

5. Sandarach, 5 oz.; mastic, 1 oz.; gum anime, ¼ oz.; alcohol, 1 pint. Dissolve by gentle heat in a clean vessel.

6. Gum sandarach, 8 oz.; clear turpentine, 3 oz.; alcohol, 1½ pint; gum mastic, 5 oz.; gum juniper, 8 oz.; turpentine, 1 oz.; alcohol, 2 quarts.

7. Sandarach, 6 oz.; elemi, 4 oz.; anime, 1 oz.; camphor, ½ oz.; alcohol, 1 quart.

8. Dissolve 2 oz. of orange shellac in 16 oz. of rectified spirits of wine. This varnish possesses the characteristic color of shellac, and consequently is not fit for work containing any purity in the whites of colors. To bleach it, add 4 oz. of freshly burned animal charcoal, and boil it for a few minutes in a water bath. The charcoal should decolorize it. To know if this has been effectually performed filter a portion of it through a piece of silk, and again through white blotting paper. If this portion be colorless the whole may be treated in the same way. If not clear enough add more charcoal and repeat the boiling. A similar varnish may be made with bleached shellac, which does not require the employment of charcoal, but it will be found that bleached

shellac is not quite so readily soluble as the natural product.

TURPENTINE VARNISHES.

1. Boil gum of turpentine till brittle, then powder and dissolve in spirits of turpentine.

2. Canada balsam, 6 oz.; white resin, 6 oz.; spirits of turpentine, 1 quart. Dissolve.

3. Canada balsam, 2 oz.; spirits of turpentine, 4 oz. Warm and stir until the balsam is dissolved.

4. Canada balsam and spirits of turpentine of each, 1 oz. This is also known as crystal varnish.

5. Best and whitest resin, 8 oz.; spirits of turpentine, 1 pint. Powder the resin, and warm by means of a water bath until dissolved.

6. Take of gum mastic of fine quality, 8 oz.; of turpentine, 1 pint, Set in a sand bath to dissolve.

7. Damar gum, 5 oz.; gum mastic, ½ oz.; gum sandarach, 2½ oz.; spirits of turpentine, ½ pint. Digest in a water bath until dissolved, stirring or shaking it occasionally.

We have purposely omitted from the foregoing recipes, all varnishes containing gum copal, on account of the special requirements for fusing, it being quite unlikely to be employed by those who make varnish for their own use. The oil varnishes we have also not given, on account of their slow drying qualities; nevertheless, drying oil may be an advantageous addition, in small quantities, to any turpentine varnish that may prove too brittle.

For window transparencies, a varnish containing

pale drying oils is of great importance; for being thin and easily bent, they are very liable to be injured if the varnish is not tough. Some of the above varnishes, with the addition indicated, may prove useful; but we recommend in preference, the employment of good coach body varnish, sufficiently diluted with turpentine to enable it to be laid evenly on the thin paper. This varnish consists of copal, drying oil and turpentine, commoner qualities having a portion of gum anime in their composition.

We cannot close this article without again cautioning our reader against the risk of fire, etc. We recommend any experiment in heating the solvents to be conducted out-of-doors until their nature is so thoroughly understood that the experience and confidence gained enable the operator to work with them quite safely in a closed apartment.

VARNISH FOR FANCY WORK.

An excellent varnish for hanging baskets or for leather-work is made of half a pound of asphaltum to one pint of turpentine. Let it stand covered over-night before using. Card-receivers and watch-receivers can be made out of butternut-shells and varnished with this preparation. It is useful also for cones and acorns.

STOVE VARNISH.

A brilliant black varnish for cooking and gasoline stoves: Asphaltum, two pounds; boiled linseed oil,

one pint; oil of turpentine; two quarts. Fuse the asphaltum in an iron pot, boil the linseed oil, and add while hot; stir well, and remove from the fire. When partially cooled, add the oil of turpentine. Some makers add driers.

Varnish needs air and ventilation to enable it to dry. A simple proof of this is that varnish in an air-tight can remains liquid; exposed to the air, it becomes skinned-over. A varnish room ought never to be "air-tight." It is no particular virtue that a varnish requires many hours or days to dry. It might dry in twenty-four hours and harden in forty-eight and still wear well. That it doesn't is because it is composed largely of oil or because the room is too air-tight. Ventilation is one of the important requisites of the varnishing-room, though drafts must be avoided.

COMMON VARNISH FOR GRATE FRONTS, &c.

Asphaltum varnish with enough ivory black in it so that it will cover well. Do not mix more than you wish to use at one time, for when it stands long it does not do so well.

OILS.

PURE OILS.

I am often asked as to "the best sort of oils" to use with paint. Even postal card replies to the inquiries are expensive. I will say here that no better oil exists than that which is pressed out of the seed.

I do not recommend the use of adulterated oils, but there are cases where the painter is obliged to use a cheap article, owing to the condition of the job he has on hand, and the price that he gets for it, and it is well enough for him to know how to prepare the oils himself if it is to be done at all. I would recommend the buying of the pure unadulterated linseed oil and fix it up to suit the occasion, and I submit the following receipts for that purpose.

TESTS FOR LINSEED OIL.

Pure linseed oil is a yellow, oily liquid, having a slight, peculiar odor, a bland taste, and a neutral reaction. When exposed to the air it gradually thickens, acquires a strong odor and taste, and finally solidifies. Its specific gravity is about 0.936. It is soluble in 5 parts of absolute alcohol, and in 15 parts of ether. It does not congeal above 4 degrees F.

It imparts a yellow color to alcohol on being agitated with it, and yields with the alkalis a very soft

soap. In contact with fuming nitric acid it ignites, but when agitated with nitric acid, of a specific gravity 1.33, it turns green, and afterwards brown. It is said that cod-liver oil is sometimes used to adulterate linseed oil. The following test for this adulterant has been recommended: Take 10 parts by weight, of the suspected oil, mix it in a small cylindrical glass tube with 3 parts of crude nitric acid, agitate the mixture well, and allow it to rest. If cod-liver oil is present the layer at the top will assume a dark brown to blackish brown color, while the acid at the bottom varies from bright orange to orange or dark yellow.

If the oil is pure it becomes, during the agitation, first sea green and afterwards dirty greenish yellow, the acid being bright yellow. As little as 3 per cent. of cod liver oil can be detected by this method. The following tests have been recommended: Mix in a two drachm vial, at ordinary temperature, (not below 60 degrees F.) equal volumes of linseed oil, either raw or boiled, and nitric acid of 1.40 specific gravity. Shake well about one-half minute, and then set aside to let the oil separate from the acid. The strata will then have the following color:

Raw oil, pure — Upper strata, light cinnamon brown; lower strata, colorless.

Raw oil, with 5 per cent. resin oil—Upper strata, light cinamon brown; lower strata, straw color.

Raw oil, with 12 per cent. resin oil—Upper strata, blackish; lower strata, colorless.

Boiled oil, pure—Upper strata, cinnamon brown; lower strata, colorless.

Boiled oil, with 5 per cent. resin oil—lower strata, straw color.

Boiled oil with 12 per cent. resin oil—Upper strata, dark olive; lower strata, deep straw color.

Boiled oil, with 50 per cent. resin oil — Upper strata, blackish; lower strata, light orange.

BLEACHING OIL.

The painter may do this by simply setting a bottle of pure oil on the window sash, where it will get the sunshine. By artificial methods, the oil is subjected to heat, treated with acid, and afterwards washed with steam.

DARK COLORED BOILED OIL.

Simmer with frequent stirring, 1 gal. RO with ¾ lb. LRG, powdered, until a skin begins to form, then remove the same and when it has become cold and has settled use off of the top.

BOILED OIL FOR CLEAR WHITE WORK.

Mix one part binoxide of M in coarse powder, but not dusty, with 10 parts of RO. Keep it gently heated and frequently stir for about 20 hours, or until the oil begins to turn to a reddish color.

ELASTIC.

10 gallons B, 5 gallons RO, 2 pounds RN, 1 pound R, 5 pounds BX, 5 gallons SW, and dissolve the RN and R in one gallon of RO, over a slow fire,

the R having been previously cut in small pieces. Allow it to stand until it becomes thoroughly dissolved. Also dissolve the BX in the SW; then mix all together, and it will be ready for use.

The BX and SW can be left out if desired. This combination is largely used by manufacturers of ready mixed paints.

COMBINATION OILS FOR MIXING PAINTS.

First Kind.—Twelve gallons, or one hundred pounds of melted RN, three gallons of crude petroleum oil, fifteen gallons of B.

Second Kind.—Twelve gallons, or one hundred pounds of melted RN, three gallons of crude petroleum naptha, ten gallons RO.

Third Kind.—For reducing RO or mixing paint—one hundred pounds of No. 2 RN, eighteen gallons best B (or enough to make it work with a brush,) two gallons of crude petroleum oil, two gallons re-run paraffine oil, four gallons of RN oil or fish oil if RN oil cannot be obtained; can mix one gallon of this No. 3 kind with one gallon RO, and it is better than all linseed oil for outside work. You can depend on the above.

COMPOSITION OIL FOR MINERAL PAINT.

Barns, Fences, Roofs, Iron Work, Etc.—1 bbl. CT, 1 bbl. PT, 1 bbl. B, 50 lbs. ASL, 10 gal. AS; mix cold. In cold weather it will be necessary to use more B than in warm. SW may be added in place of the mineral, which will give a gray.

ADULTERATION FOR OIL.

Fish oil, oderless B or CSO can be used to adulterate linseed oil.

LW can be used in priming rough work, half and half.

DRYING OIL.

EQUAL TO PATENT DRYER. RO, 2 gal., add LR, LRG, and umber, of each 4 oz., add SL and ZS 2 oz. each. Boil slow for four hours.

PAINTS.

PATENT READY MIXED PAINTS.

We do not recommend the use of any cheap article of paints, but there are times when the painter is obliged to use it. While it is not our mission to discuss the merits or demerits of any one brand of the so-called *Patent Ready Mixed Paints*, we will state some points that may be of use to our readers, so that they in their intercourse with their patrons can talk intelligently on this subject.

1st. It has not the body of lead.

2nd. It might not chalk off as some brands of lead does but the fact remains that if it does not chalk off, it will either crack or peel.

3rd. If you are to have an adulterated paint, why not mix it yourself, when you know what you are using, and have a better and cheaper paint without buying the cans and fancy labels.

4th. If you mix your own paints you will not need to go to the expense of keeping a stock of all colors on hand.

We will give our readers some formulas for their consideration so that if necessary you can mix to please yourself.

1st.—100 lbs. white lead in oil,	3 gallons.....	$ 6	25
100 lbs. WZ "	5 "	7	25
22 gallons oil, raw,	22 "	13	20
	30 gallons,	$26	60

Cost per gallon, 88⅔ cts.

2nd.—100 lbs. white lead in oil,	3 gallons...	$ 6	25
100 lbs. WZ, dry,	5 " ...	6	50
33 gallons oil, raw,	33 " ...	19	80
	41 gallons,	$34	55

Cost per gallon, 83⅔ cts.

3rd.—100 lbs. white lead in oil,	3 gallons...	$ 6	25
100 lbs. WZ, dry	5 " ...	6	50
50 lbs. PW, dry	3 " ...	1	50
42 gallons RO,	42 " ...	25	20
	53 gallons	$39	45

Cost per gallon, 74½ cts.

4th.—50 lbs. white lead in oil,	1½ gal....	$ 3	12½
100 lbs. WZ, dry,	5 "	6	50
50 lbs. PW, dry,	3 "	1	50
30 gal. RO,	30 "	18	00
10 gal. LW,	10 "		5
	49½ gal.,	$29	17½

Cost per gallon, 57 cts.

5th.—100 lbs. WZ, dry,	5 gallons.....	$ 6	50
50 lbs. PW, dry,	3 "	1	50
50 lbs. YO, dry,	3 "	1	50
10 gal. RO,	10 "	6	00
30 gal. elastic oil,	30 "	6	00
	51 gallons,	$21	50

Cost per gallon, 42 cts.

Thus we could continue until we had the cost down to almost nothing, but we have given only the very best and most durable coloring matter such as black, red, yellow, blue, &c, can be added to the above so as to get any desired shade that you wish. Changes can be made in any direction you wish, such as adding more WL, or leaving it out, or more or less of any of the other articles as occasion requires.

The ready mixed paints that are now to be seen in the stores for sale, with flashy labels, lauding their excellent qualities, do not contain an ounce of lead, and but very little linseed oil. Lead, as all painters know, would go to the bottom, and there form a hard

cake in course of time. The principle pigment used in nine-tenths of the so-called paints is WZ and PW with umber—black, red, yellow, &c., to give them the proper shade. The vehicle used is the elastic oil.

SUBSTITUTE FOR WHITE LEAD.

WZ 75 lbs. dry, MR 30 lbs. Mix well together; run it through the mill, or, if you have no mill, a fine strainer. If you want a clear white or tint job use RO and TT, half and half. For plastered walls (inside) you will find that you will have a much better job than you would by using pure white lead, as the work stands out better and finishes like varnish-work. If you wish a rough, cheap job, use the elastic oil for first and second coats. The MR can be left out, and PW or BT substituted. Do not put any dryer in until you are ready to use the paint.

SUBSTITUTES FOR WHITE LEAD.—Native barytes or barium sulphate, is mixed with pulverized stone, coal and tar, and exposed to an intense heat, so as to convert it into barium sulphide. The latter, being soluble, can be dissolved out, and to the clear solution is added a corresponding quantity of zinc chloride in solution. To the solution of barium chloride, I added white vitriol (zinc sulphate), when a precipitate of barium sulphate will be formed, and zinc chloride left in solution, which latter can be filtered and again employed to precipitate barium sulphide.

The two precipitates, obtained as above, namely, zinc sulphide and barium sulphate, are well washed

mixed, dried, heated to a cherry red, then thrown into cold water, and finally ground in water and dried. The white pigment thus obtained covers well, and is well suited to mix with oil, as a substitute for lead, especially where sulphur compounds exist or may be generated.

XX will be found to answer. It has a good body and is very durable, either inside or out but does not do so well on plastered walls as the WZ.

ADULTERATION FOR WHITE LEAD.

To 50 lbs. white lead add 25 lbs. WZ dry, and 25 lbs. PW or BT. You will find that the paint will still have a good body and will reach as far as 300 lbs. of all pure lead. Mix the WZ and PW (or BT) first and run through the mill or strainer, then put the lead in after breaking it up. Use pure RO and TT for inside work half and half.

A CHEAP PAINT FOR ROOF WORK.

50 lbs. mineral paint—ochre, brown or venitian red, which ever is convenient—50 lbs. PW and 50 lbs. road dust. Then mix with oil and run through the mill, and if ground fine will do for priming or second coating any kind of rough work and is very durable.

By adding ½ bushel of ASL, and thinning with half oil and half sweet milk, you will have a still cheaper paint.

FIRE PROOF PAINT.

70 lbs. WZ, 30 lbs. ASL, 50 lbs. WL, 10 lbs. ZS. Mix the WZ and ASL together and grind in the elastic oil, then add 1 gal. 35 degrees SG, then the WL and ZS. Stir well. This will make a white paint, and if you wish the color changed, add any pigment that you wish to get the shade you desire.

You have about as much paint in the above to go about as far as 300 lbs. of pure white lead, at a cost of about one third.

GREEN PAINT.

I. 5 lbs. YO, dry, 1 lb. orange chrome, dry; 4 oz. Prussian Blue; grind in oil.

II. 5 lbs. YO dry; 2 lbs. canary chrome; 5 lbs. MR; 6 oz. Prussian blue; grind in oil.

III. 5 lbs. YO, dry; 4 lbs. orange chrome; 3 oz. Antwerp blue; grind in oil. This makes a very clear color, which you can make either light or dark at pleasure. If you wish to make it lighter, add more chrome or YO; if darker, add more blue. This recipe is worth its weight in gold, as you will find after using it.

Use No. 1 for first and second coats, or No. 2 for the first and second coats and finish with No. 3. If you have no mill, get the colors ready ground in the same proportion as the dry.

ECONOMY IN MAKING COLORS.

PRUSSIAN BLUE.—First. Take nitric acid, any buantity; and as much iron shavings from the lathe

as the acid will dissolve; heat the iron as hot as can be handled with the hand, then add to it the acid in small quantities as long as the acid will dissolve it. Second. Take prussate of potash, dissolve it in hot water to make a strong solution, and mix sufficient of it with the first to the depth of tint required.

ANOTHER METHOD.—A very passable Prussian blue is made by taking the sulphate of iron (copperas and prussate of potash, equal parts of each, and dissolve in water, then mixing the two together.)

CHROME YELLOW.—First. Take SL and PW, or each 5 lbs., dissolve them in hot water. Second. Take bi-chromate of potash, 6½ ozs., also dissolve it in hot water. Each article to be dissolved separately, then mix all together, putting the bi-chromate last. Let stand 24 hours and drain off the water. Let it dry and it is ready for use.

CHROME GREEN.—Take PW, 6½ lbs., SL and blue vitriol each 3½ lbs., AN 10½ ozs., best soft Prussian blue and chrome yellow, of each 3½ lbs. Mix while dry, then add 1 gallon of water, stirring well. Let stand three or four hours, or until it settles, then drain off the water, let it dry, when it will be ready for use.

A GOOD GREEN.—Take unslaked lime of the best quality; slack it in hot water, then sift it through a fine seive, then add a strong solution of AN water. Then color it with bichromate of potash and sulphate of copper until the color suits your fancy.

ANOTHER METHOD.—Blue vitriol 5 lbs., SL 6½ lbs., arsenic 2½ lbs., bichromate of potash 1½ lbs.

Mix dry then add three pints water; mix well; let stand for three or four hours, then drain off the water. It is dangerous to handle.

When any of the above mixtures have stood as mentioned, all that is necessary to drain off the water is to place the preparation into a muslin bag for that purpose, then expose the mixture to the air to dry for use. Glass, stone or wood vessels only should be used, as the acids soon work upon the iron, tin or copper, giving a tinge not desired to the color; and also observe that if water is mixed with strong acids it must be added slowly, especially in tight vessels, by means of the great heat which is set free by the combination.

ADULTERATIONS THAT MAY BE USED IN MIXING PAINTS.

In case that you have a rough job and want to get a good body upon it at a small cost, use for the first coat LW, or the contents of the dissolvent keg, adding a little SP, or anything that you may have in the way of a pigment to fill the pores.

Dust of the road is very good after it has been well cleaned. You can carry it right through the first, second and third coats.

To clean the road dust, first get a large tub filled with water, then put the dust into it, making it about as thick as second coating. Let it stand for a day or two, until it is settled. Drain the water off the top, and you will find that the coarse sand is at the bottom and the fine on top, which, after drying will be

ready for use. This has a good body and makes a durable pigment. It can be used to adulterate any dark color.

WATERPROOF OIL RUBBER PAINT.

Dissolve 5 pounds of india rubber in 1 gallon of BO by boiling. If this is too thick, reduce with BO; if too thin use more rubber. Especially applicable to cloth, but valuable for any other material.

WATERPROOF RUBBER PAINTS FOR OVERCOATS, ETC,

Get one old worn out rubber boot, put into a kettle with one gallon RO. Boil slow until the boot is dissolved. Then strain, add 3 ozs. of black oxide of M. If too thin add more rubber; if too thick, add more oil, or you can thin it with TT.

The above can be used in place of R, where it occurs in other recipes. R is very expensive.

HOW TO MIX WATER WITH PAINT.

Take SA 3 oz., caustic lime 3 oz., dissolve in one gallon of SW; then stir in gradually ¼ gallon RO; let stand for three or four days. Take one part of this mixture and mix with two parts of RO. It is now ready for use.

MISCELLANEOUS.

RECIPE FOR LUMINOUS PAINT.

Sulphide of calcium (Canton's Phosphous) mixed with any varnish, will produce what is known as luminous paint

LUMINOUS PAINT AGAIN.—Take 100 parts of resin oil, which is to be boiled in a suitable pan with 30 parts of freshly slaked, raising the heat by degrees. This mass is at first lumpy, then becomes tougher, and afterwards passes into a thin liquid. At 300 degrees Fahr., the entire surface of the liquid becomes luminous in the dark. At 380 Fahr. bluish white light is very strong in the dark. Objects dipped in the liquid remain luminous for some time. Care should be taken in the making of this paint, and those who are unskillful should not attempt it. There are several establishments who make a good quality that is on sale at all first class paint stores. This paint is used extensively by secret societies who have an emblem of mortality in their initiatory work. Give the emblem a coat of SH. Then coat when dry with the luminous paint, not to exceed two coats, one good coat if put on properly will do. Expose the object to a strong light during the day and if possible give it strong light on up to the time you wish to use it. Place the object in the position that you

wish, and shut out all the light from the room, and you will then have a good effect. The darker the room is the better.

PAINT SKINS—TO SAVE AND REDUCE TO OIL.

Dissolve Sal Soda, ½ lb. in 1 gallon SW.

The skins that you have can be put into the above. Let stand 4 or 5 days, then put them into a kettle and boil them, adding sufficient oil to thin to a proper consistency for painting or straining.

DISSOLVENT FOR PAINT SKINS.

2 lbs. concentrated lye, 5 lbs. unslaked lime to 15 gal. of water. Put in the skins and dirty buckets, stir them up occasionally. When the skins are dissolved pour off the lye-water and the paint in the bottom will do for priming rough weather boarding or brick walls. Do not throw the water away as it will do for another time by adding more lye to it.

TO SOFTEN PUTTY AND REMOVE PAINT.

To destroy paint on old doors, etc., and to soften putty in window frames, so that the glass may be taken out without breakage or cutting, take equal portions of SO and quick lime, and with water, mix them into a thick paste. Coat the work with this, allowing it to stand about an hour, when it must be thoroughly washed with water. This is a speedy method of removing old paint, but it must be

used with caution. That is to say, the coating must be removed at the instant that solution has taken place, otherwise the wood will be furred up, and alkali deposited in its fibers to the subsequent detriment of the painting.

GLASS FROSTING OR CRYSTALIZING.

Dissolve ES in gum-arabic water; let stand over night, and after cleaning the glass off well, flow the solution on so that it will not run; lay the glass flat if convenient, and when it commences to set, take a pointed stick and dot it in rows to suit the taste; put the dots about 1½ inches apart. If you wish it colored, use analines—red, blue, green and gamboge for yellow or gold color.

FROSTING GLASS.

The *Scientific American* of recent date gives the folwloing method of frosting glass without the use of paint. Clean the glass and moisten it with ordinary hydrofloric acid. As soon as the frosting is satisfactorily completed, wash off with water.

I have not tried the above but think that it will work.

TO PEARL OR CRYSTALIZE TIN.

Take sulphuric acid, 4 ozs.; soft water, 2 or 4 ozs., according to the strength of the acid; salt 1 oz., mix. Heat the tin quite hot over a stove or heater then with a sponge, wet it with the mixture, washing off directly with clean water. Dry the tin; then varnish with Damar varnish.

EBONIZING.

How to make woods, such as cherry, mahogany etc., look like ebony is often desirable, and a correspondent gives the following directions:

To imitate black ebony, first wet the wood with a solution of logwood and copperas, boiled together, laid on hot. For this purpose two ounces of logwood chips, one and one-half ounces of copperas to a quart of water will be required. When the work has become dry, wet the surface again with a mixtue of vinegar and steeling two ounces of steel filings in one-half pint of vinegar. When the work has become dry again, sand-paper down until quite smooth. Then oil and fill in with powdered drop-black mixed in the filler. Work to be ebonized should be smooth, and free from holes, etc. The work may receive a light coat of quick drying varnish, and then be rubbed with finely pulverized pumice-stone and linseed oil until very smooth.

JAPAN FLOW FOR TIN AND IRON.

Take gum sandarac 1 lb.; balsam of fir, balsam of tolu, and acetate of lead, of each 2 ozs., and linseed oil ½ pint. Put these into a suitable kettle, over a slow fire at first, then raise to a higher heat until all are melted; now take from the fire and when a little cool stir in spirits of turpentine, two quarts, and strain through a fine cloth. This is transparent, but by the following modifications any or all of the various colors are made from it.

BLACK.—Melt asphaltum, 2 ozs., in spirits of turpentine ½ pint, then rub up Prussian blue, ½ oz. with a little of it, mix all well and strain; then add the whole to one pint of the first above

BLUE.—Take indigo and Prussian blue, both finely pulverized, of each ½ oz, spirits of turpentine, 1 pint. Mix well and strain. Add of this to 1 pint of the first until the color suits.

RED.—Take spirits of turpentine ½ pint, add cochineal ½ oz.; let stand 15 hours and strain. Add of this to the first to suit the fancy.

YELLOW.—Take 1 ounce of pulverized root of cucuma and stir off into 1 pint of the first until the color suits, let stand for a few hours and strain.

GREEN.—Mix equal parts of the blue and yellow together, then mix with the first until it suits.

ORANGE.—Mix a little of the red with more of the yellow, and the first, as heretofore, until suited.

In this simple way you get all the various colors. Apply with a brush.

CHINESE GOLD LACQUER.—An excellent imitation of this celebrated gold lacquer may be prepared by melting two parts of shellac and one of copal, so as to form a perfect fluid mixture, and then add two parts of alcohol. The vessel is then to be removed from the fire and a tenth of the bulk of the whole of the oil of turpentine gradually added. The addition of a solution of turpentine or gum gamboge for yellow and of gum dragon for red will improve the color. The Chinese apparently use tin-foil as a ground for lacquer varnish.

FURNITURE POLISH—For renovating furniture is made by mixing one pound each of olive oil and oil of amber with one ounce of tincture of henna. This mixture should be kept in a stoppered bottle. The wood is renovated by being briskly rubbed with a piece of raw cotton dipped in this mixture, and rubbed dry with a dry cotton rag.

THINNING THICK COLOR of any kind when taken from the can, beat it thoroughly before adding liquid; then add a small portion at a time, thoroughly mixing after each addition, until the desired consistency is obtained. If a thinner is added in a large quanity, no amount of stirring or beating will break the lumps, and straining will be necessary. This rule applies to almost every thick paste or mass. Keg lead can be mixed quickly and nicely in this way.

VARNISHING UNDRIED LETTERS.—Where a job is to be hurried out and a coat of finishing varnish put on while the lettering is still not dry, take some shellac and with a soft large-sized camel's-hair pencil coat the letters over. The shellac will dry in a few minutes, and the lettering be as good for varnishing as if done a week.

VIOLIN VARNISH.—Twelve parts sandarac, six parts of shellac, six parts mastic, one hundred and fifty parts ninety-five-per-cent. alcohol, six parts Venice turpentine. Mix and dissolve warm.

TO FROST GLASS.—The frosting of glass to keep out the sun is done by using the following paint: Sugar of lead well ground in oil, applied as other

paint, then pounced, while fresh, with a cotton duster. When partially dry, with a straight edge laid upon the sash, run along by the side of it a stick sharpened to the width of the line in any figures or squares you choose.

LAMP BLACK has been known to take fire spontaneously. This should be stored in moderate quantities in a place where little damage can occur from its combustion, and in tin cans tightly covered.

GILDING ON SATIN AND CLOTH.—A strong isinglass solution is applied with a camel's-hair pencil; when dry, a coating of gold size, on which, when tacky, the leaf is laid, and then pressed with a piece of soft chamois leather.

TO STENCIL ON DISTEMPER PAINTS.—To have a color in distemper work sharp, and one that will not spread, mix as much color as is required to a stiff paste with linseed oil. When well mixed or ground, lay the color on a heavy coarse brown paper for an hour or more. This will absorb the fatty and sticky portion of the oil, and prevent any danger of spreading. It may then be thinned with turpentine to the proper consistency.

POLISHED FLOORS.—A remarkable innovation has been made—that of the application of soluble glass to floors, the waterglass being previously colored if desired. It gives a polished, smooth and handsome surface. The seams are first filled with a cement of waterglass and gypsum. Successive coats of waterglass of the consistency of syrup are applied with a

stiff brush. A higher finish is given by pumicing off the last layer and then putting on a new coat of oil.

Rebronzing of Gas-Fixtures.—A convenient preparation for rebronzing gas-fixtures is made by mixing bronze powder with any transparent varnish—say amber, gum damar or copal. Do not mix more than you are going to use at once, because most bronze powders act as powerful dryers, and what you have left of the mixture soon becomes hard and useless. It is better to put a little of the varnish into a small flat saucer and some of the loose powder next into it, and mix with the brush while you are using it, as a painter mixes colors on his palette.

Coloring Oak.—There is no doubt that the taking out of some of the dark color of your ammonia stained oak is due to the action of light. Under general circumstances light is antagonistic to the dark hue of oak, for an old piece after being planed loses some of the mellow tone it had at first.

To Use Bronze Powder.—Mix with rubbing varnish to a stiff paste, then thin with turps to the proper consistency to use with a brush.

To Make a Good Cement for Sticking Porcelain Letters on Glass.—Mix starch, sixty parts; finely pulverized chalk, one hundred parts. Mix with equal parts of water and alcohol with the addition of thirty parts of Venice turpentine, taking care to agitate the mass with a stick so as to insure its homogeneity.

ANOTHER WAY.—Mix a stiff putty with white lead and good coach varnish.

A GOOD PUTTY FOR IRON.—Take zinc white (dry), work it up into a stiff paste with silicate of soda or silicate of potash.

GLYCERINE PUTTY.—This is made of good thick glycerine and white lead and litharge. It hardens in fifteen to forty-five minutes, and withstands water and acids. It should be used warm and freshly made.

KEEP PLENTY OF PAINT AND VARNISH POTS. A set of paint and varnish pots should be kept in lye continually. A small paint-shop should have from half a dozen to a dozen pots all the time, and they should be clean, while a large shop will need two dozen or more.

I don't believe in throwing in and taking out a pot every time one is needed. When one set is taken out of the lye quite free from paint or varnish, then put in another set; or if those you take out are not clean enough, then put them back again.

There is no sense in keeping on hand a lot of pots filled with old paint that is no longer of any use.

METAL-BACK GILDING ON GLASS.—Pounce the design on the outside of the glass with a pricked pattern; gild solid, as usual; coat with glass gold size, and let dry. Coat the solid gilding with damar varnish; let it stand till tacky; then lay on tin foil, lap the edges and smooth it down hard with a palette-knife. Reverse the pricked pattern to read back-

ward, and pounce the letters on the solid tin foil; cut the lines of the letters through to the glass with a sharp-pointed knife; use an iron ruler for the straight lines, and cut curves as in cutting stencils. Carefully pick out all surplus foil; press the letter edges where needed; clear the glass of damar with turps, and shade on edge to suit. Many sign-writers do not know this method.

To Remove Paint Stains from Clothes.—Chloroform is an excellent medium for the removal of paint stains from the clothes, etc. It is found that portions of dry white paint which resisted the action of ether, benzole aud bisulphide of carbon . re at once dissolved by chloroform. If the paint is fresh, turpentine or alcohol will remove it.

Mixture for Cleaning Furniture.–Cold-drawn linseed oil, 1 quart; spirits of wine, and vinegar, ½ pint each; butter (terchloride) of antimony, 2 ounces; spirits of turpentine, ½ pint. This mixture requires to be well shaken before it is used. A little of it is then to be poured upon a rubber, which must be well applied to the surface of the furniture; several applications will be necessary for new furniture, or for such as had previouly been French polished or rubbed with bees' wax.

Furniture Polish.—Dissolve 4 ounces best shellac in 2 pints 95 per cent. alcohol; add to this 2 pints linseed oil, and 1 pint spirits turpentine; when mixed, add 4 ounces sulphuric ether, and 4 ounces ammonia water; mix thoroughly. Shake when used,

and apply with a sponge lightly. This is an excellent article, especially where the varnish has become old and tarnished.

POLISHING PASTE. — Take 3 ounces white wax, ½ ounce Castile soap, 1 gill turpentine. Shave the wax and soap very fine and put the wax to the turpentine; let it stand 24 hours; then boil the soap in 1 gill water, and add to the wax and turpentine. This has been highly recommended.

FURNITURE POLISH.—Bees' wax, ½ pound; alkanet root, ¼ ounce; melt together in a pipkin until the former is well colored. Then add linseed oil, and spirits of turpentine, of each ½ gill; strain through a piece of coarse muslin.

FURNITURE PASTE.—Turpentine, 1 pint; alkanet root, ½ ounce; digest until sufficiently colored, then add bees' wax, scraped small, 4 ounces; put the vessel into hot water and stir until dissolved. If wanted pale, the alkanet may be omitted.

TO WAX FURNITURE.—In waxing, it is of great importance to make the coating as thin as possible, in order that the veins of the wood may be distinctly seen. The following preparation is the best for performing this operation. Put 2 ounces white and yellow wax over a moderate fire, in a very clean vessel, and, when it is quite melted, add 4 ounces best spirits of turpentine. Stir the whole until it is entirely cool, and you will have a pomade fit for waxing furniture, which must be rubbed over it according to the usual method. The oil soon penetrates

the pores of the wood, brings out the color, causes the wax to adhere better, and produces a lustre equal to that of varnish, without being subject to any of its inconveniences. The polish may be renewed at any time by rubbing it with a piece of *fine* cork.

COMPOSITION FOR SOFT OR LIGHT MAHOGANY.— Boil together cold drawn linseed oil, and as much alkanet root as it will cover, and to every pint of oil add 1 ounce of the best rose pink. When all the color is extracted, strain it off, and to every pint add ½ gill spirits of turpentine. This will be a very superior composition for soft and light mahogany.

VARNISH FOR ENGRAVING ON GLASS.— Wax, 1 ounce, mastich, ½ ounce. asphaltum, ¼ ounce, turpentine, ½ drachm.

ETCHING VARNISHES.— White wax, 2 ounces, asphaltum, 2 ounces. Melt the wax in a clean pipkin, add the asphaltum in powder, and boil it to a proper consistency. Pour it into warm water, and form it into balls, which must be kneaded, and put into taffeta for use. Or: White wax, 2 ounces, Burgundy pitch, ½ ounce, black pitch, ½ ounce. Melt together, and add by degrees 2 ounces powdered asphaltum, and boil it till a drop cooled on a plate becomes brittle.

ETCHING FLUID FOR COPPER.— Aquafortis, 2 ounces; water, 5 ounces. Mix.

ETCHING FLUID FOR STEEL.—Iodine, 1 ounce; iron filings, ½ drachm; water, 4 ounces. Digest till the iron is dissolved. Or: pyroligneous acid 4 parts by

measure; alcohol, 1 part. Mix, and add one part double aquafortis (specific gravity 1.28). Apply it from 1½ to 15 minutes.

To Make Colored Prints Resemble Oil Paintings.—Take of Canada balsam, 1 ounce; spirit of turpentine, 2 ounces; mix them together. Before this composition is applied, the drawing or print should be sized with a solution of isinglass in water, and, when dry, the varnish should be applied with a camel's hair brush.

India-rubber Varnish.—Digest in a closed vessel, at a gentle heat, 1 ounce India-rubber shavings in 1 pint of rectified mineral naptha, or benzole then strain it. This dries very badly and never gets perfectly hard.

Tough India-rubber Varnish.—Dissolve by heat 1 ounce India-rubber in 1 quart of drying oil. This dries very tough in about 48 hours.

Flexible Varnish.—Boil 3 ounces dried white copperas, 3 ounces sugar of lead, and 8 ounces litharge, in 1 gallon linseed oil; stir constantly until it strings well, then cool slowly and decant the clear portion. If too thick, thin with quick-drying linseed oil.

To Color Rattan Furniture Black.—Apply a strong solution of extract of logwood; when dry, brush the surface, and then add a weak solution of bichromate of potash. Should gray spots appear, reapply to them the last solution and rub the surface with a woolen cloth.

To Transfer Prints to Glass.—First coat the glass with damar varnish or else with Canada balsam mixed with an equal volume of oil of turpentine, and let it dry until it is very sticky, which takes half a day or more. The printed paper to be transferred should be well soaked in soft water and carefully laid upon the prepared glass, after removing surplus water with blotting paper, and pressed upon it, so that no air bubbles or drops of water are seen underneath. This should dry a whole day before it is touched; then with wetted fingers begin to rub off the paper at the back. If this be skilfully done, almost the whole of the paper can be removed, leaving simply the ink upon the varnish. When the paper has been removed, another coat of varnish will serve to make the whole more transparent,

To Varnish Drawings, or any kind of Paper or Card Work.—Dissolve 1 ounce best isinglass in about 1 pint of water, by simmering it over the fire; strain it through fine muslin, and keep it for use. Try the size on a piece of paper moderately warm. If it glistens, it is too thick, and requires more water; if it soaks into the paper, it is too thin, and needs more isinglass; it should merely dull the surface. Then give the drawing 2 or 3 coats, letting it dry between each, being careful (particularly in the first coat) to bear very lightly on the brush (which should be a flat camel's-hair), from which the size should flow freely; otherwise, the drawing may be damaged. Then take the best mastich varnish, and with it give at least three coats. This is the method used by

many eminent artists, and is found superior to any that has been tried.

To Etch on Glass.—Etching with hydrofluoric acid on plate glass is practiced now to a very considerable extent. The French manufacturers especially producing splendid ornamental effects by this process. The drawings to be imitated or etched on the glass are first made on stone or plate and then printed on unsized paper with an ink consisting principally of a solution of asphaltum in oil of turpentine made with the aid of heat, to which some substance is added which shows a more or less crystalline structure on cooling, as stearic acid, spermaceti, naphthaline, paraffine. The mixture is strained and rapidly cooled with constant stirring; it is the only kind of coating wh ch thoroughly resists the action of the corrosive acid. The printed paper is laid flat with the blank side on water, to which from 10 to 25 per cent. of muriatic acid has been added, and as soon as the lines show signs of softening the negative printing is transferred to the glass by a slight pressure; when the paper is removed, the picture will adhere to the glass, and this is afterwards exposed to the fluoric vapors in leaden troughs.

To Remove Paint Stains from Clothes.—Chloroform is an excellent medium for the removal of stains of paint from clothes, etc. It is found that portions of dry white paint, which resisted the action of ether, benzole, and bisulphide of carbon, are at once dissolved by chloroform. If the paint is fresh, turpentine or alcohol will remove it.

To Take Stains Out of White Marble.—Take 1 ox-gall, 1 wine-glass soap lees, ½ wine-glassful turpentine; mix and make into a paste with pipe clay. Put on the paste over the stain and let it remain for several days. If the stain is not fully removed a second application will generally prove sufficient.

German Receipt for Coating Wood with a Substance as Hard as Stone.—Melt together 40 parts of chalk, 50 resin, and 4 linseed oil; to this should be added 1 part oxide of copper, and afterwards 1 part sulphuric acid. This last ingredient must be added carefully. This mixture, while hot, is applied with a brush, and forms, when dry, a varnish as hard as stone. This is an excellent application to protect posts, tubs, or other wooden articles which are set in the earth.

To Make Transfer Paper.—To prepare transfer paper, take some thin post or tissue paper, rub the surface well with black lead, stove polish, vermillion, red chalk or any other coloring matter; wipe this preparation well off with a piece of clean rag, and it will be ready for use.

To Remove the Varnish from Oil Paintings, etc.—Varnish and dirt can be removed by washing over with a weak solution of carbonate of ammonia, wiping it off with a sponge wetted with water as soon as it has fulfilled its object; if allowed to remain too long it will injure the oil colors. Another way is to spread a thick coat of fuller's earth over the surface

of the varnish, leaving it on long enough to soften it; it may then be removed by washiug.

PAINTS SUITABLE FOR IRON.—The paints made from iron oxides are the best preservers of iron, viz: Spanish Brown, Venetian reds, Indian reds, Purple browns, and Colcothars. Oxide of zinc ranks next in importance to those named.

AN EYE FOR COLOR.—Worth, the man Mantua-maker of Paris, is said to keep an aviary of birds, from the varied plumage of which, he copies color effects.

TO PAINT ZINC.—A difficulty is often experienced in causing oil colors to adhere to sheet zinc. Boettger recommends the employment of a mordant, so to speak, of the following composition: 1 part chloride of copper, 1 of nitrate of copper, and 1 of sal-ammoniac are to be dissolved in 64 parts of water, to which solution is to be added 1 part of commercial hydrochloric acid. The sheets of zinc are to be brushed over with this liquid, which gives them a deep black color; in the course of 12 to 24 hours they become dry, and to their now dirty gray surface a coat of any oil color will firmly adhere. Some sheets of zinc prepared in this way, and afterwards painted, have been found to withstand all the changes of winter and summer.

METALS ALL YIELD PIGMENTS.—From Arsenic is obtained Kings-yellow and Orpiment; Cadmium yields a vivid yellow, called cadmium yellow; Cobalt gives as cobalt-blue and smalt. From Copper is

produced Emerald green and Verdigris; Iron is drawn upon, and gives bountifully the pigments known as Venitian-red, Indian-red, Mars-yellow and Mars-orange; (*Mars* is an old name for iron.) Lead furnishes White-lead, Kremintz, Flake and China-white; Patent-yellow, red-lead and Orange-mineral; Mercury adds to the painter's list of colors, the brilliant red known as Vermilion; Zinc gives us a beautiful white, called Zinc white.

White Used by the Egyptians and Romans.—The white employed by the Egyptians, is supposed by Mereniee to have been simply plaster of Paris (sulphate of lime) mixed with a certain glue or mucilage.

To Paint Whitewashed Walls.—When the second coat of glue size is dry, paint as follows: Mix the first coat of paint in the proportion of one gallon of raw linseed oil to 15 pounds white lead, ground in oil, and 1 gill of dryer. Second coat: 1 gallon raw linseed oil, 25 pounds white lead, ground in oil, and ½ gill dryer. (The lead should be the best.) Then finish in either gloss or flat color, the same as if it were wood work with one good coat of priming. Shade all coats of paint, as near as you can, to the color you wish to finish in. Mix the third and fourth coats the same as the first, that is, about the same thickness for a gloss finish, and a little thinner for a flat finish.

Flexible Paint for Canvas.—Dissolve 2½ pounds good yellow soap, cut in slices in 1½ gallons

boiling water; grind the solution while hot in 140 pounds good oil paint.

DURABLE BLACK PAINT FOR OUT-DOOR WORK.—Grind powdered charcoal in linseed oil, with sufficient litharge as drier; thin for use with well-boiled linseed oil.

GREEN PAINT FOR OUTSIDE WORK.—Add to the black paint, according to the last receipt, sufficient yellow ochre to make the shade of green required. This is preferable for garden work, to the bright green paint generally used, as it does not fade.

TURNBULL'S PRUSSIAN BLUE.—Ferricyanide (red prussiate) of potassium, 10 ounces; Solution of protosulphate of iron, 1 pint; water 3 pints. Dissolve the ferricyanide of potassium in 1 part of water, and add the solution, gradually, to the solution of potosulphate of iron previously diluted with the remainder of the water, stirring the mixture during the addition. Then filter the liquid, and wash the precipitate on the filter with boiling water until the washings pass nearly tasteless. Lastly, dry it, and rub into fine powder. It may also be made by adding protosulphate of iron to a mixture of yellow Prusiatic of potash, chloride of soda, and hydrochloric acid. This, mixed with water, makes an excellent blueing.

PRUSSIAN BLUE.—Percyanide, ferrocyanide, or ferroprussiate of iron. Commercial Prussian blue is made by adding to a solution of prussiate of potash (or of prussiate cake), a solution of 2 parts alum and 1 part sulphate of iron, washing the precipitate

repeatedly with water to which a little muriatic acid has been added, and exposing it to the air until it assumes a deep blue color. A purer kind is made by adding a solution of persulphate or perchloride of iron to a solution of pure ferroprussiate of potash.

GILDING IVORY.—Immerse it in a solution of nitro-muriate of gold, and then expose it to hydrogen gas when damp. Wash it afterward with water.

TO MAKE PAINT WITHOUT OIL OR LEAD.—Whiteing, 5 pounds; skimmed milk, 2 quarts; fresh slacked lime, 2 ounces. Put the lime in a stone ware vessel, pour upon it a sufficient quantity of the milk to make a mixture resembling cream; the balance of the milk is then to be added; and lastly the whiting is to be crumbled upon the surface of the fluid into which it gradually sinks. At this period it must be well stirred in, or ground as you would other paint, and it is fit for use. There may be added any coloring matter that suits the fancy, to be applied in the same manner as other paints, and in a few hours it will become perfectly dry. Another coat may then be added, and so on until the work is done. This paint is of great tenacity, bears rubbing with a coarse cloth, has little smell, even when wet, and when dry is inodorous. It also posesses the merit of cheapness, the above quantity being sufficient for 57 yards.

BLACK STAINS FOR IMMEDIATE USE.—Boil ½ pound chip logwood in 2 quarts water, add 1 ounce pearl-ash, and apply it hot to the work with a brush. Then take ½ pound logwood, boil it as before in 2

quarts water, and add ½ ounce verdigris and ½ ounce green copperas; strain it off, put in ½ pound rusty steel filings; with this, go over the work a second time.

To Stain Wood Like Ebony.—Take a solution of sulphate of iron (green copperas), and wash the wood over with it 2 or 3 times; let it dry, and apply 2 or 3 coats of a strong hot decoction of logwood; wipe the wood, when dry, with a sponge and water, and polish with linseed oil.

Bright Yellow Stain.—Wood need not be stained yellow, as a small piece of aloes put into the varnish will have the desired effect.

To Stain Boxwood Brown.—Hold the work to the fire, that it may receive a gentle warmth; then take aquafortis, and with a feather pass over the work until it changes to a fine brown (always keeping it near the fire); then oil and polish it.

Cane Staining.—By the following simple process canes and similar sticks may be stained a rich brown. Dissolve a few grains sulphate of manganese in sufficient water to take it up; moisten the surface of the cane with it, and hold it over the flame of a spirit lamp close enough to scorch it. By care, the whole surface may be brought to a uniform rich brown, or beautifully variegated by heating some parts more than others; thus varying the color from white to the deepest black. The color will appear dull at first; but on oiling it with raw linseed oil, and rubbing it with a smooth piece of hard wood, it will be beau-

tifully developed. Give the cane no other finish, unless it be another oiling some days after the first.

CLARIFIED LINSEED OIL FOR VARNISH.—Heat in a copper boiler 50 gallons of linseed oil to 280 degrees Fahr.; add 2½ pounds of calcined white vitriol, and keep the oil at the above temperature for ½ hour; then remove it from the fire, and in 24 hours decant the clear oil, which should stand for a few weeks before it is used for varnish.

PREPARATION OF LINSEED OIL FOR MAKING OIL VARNISHES.—In the manufacture of oil varnishes, one of the most important points is the use of good drying oil. Linseed oil for this purpose should be pale, limpid, brilliant, scarcely odorous, and mellow and sweet to the taste. 100 gallons of such oil are put into an iron or copper boiler capable of holding 150 gallons, and gradually heated to a gentle simmer for 2 hours, to expel moisture; the scum is then carefully removed, and 14 pounds scale litharge, 12 pounds red lead, and 8 pounds powdered umber (all carefully dried and free from moisture), are gradually sprinkled in; the whole is then kept well stirred, to prevent the dryers sinking to the bottom, and the boiling is continued at a gentle heat for 3 hours longers; the fire is next withdrawn, and in 24 to 36 hours, the scum is carefully removed, and the clear oil decanted from the bottom. This forms the best boiled or drying oil.

CLAIRIFIED OIL FOR VARNISH.—When boiled oil is used for making varnish, and a still further clarifying is deemed advisable, it is placed in a copper pan

holding from 80 to 100 gallons, and heat gradually applied till the scum rises. after removing which the oil is allowed to boil for about 2 hours, when it is dosed with calcined magnesia, in the proportion of an ounce to every 4 gallons of oil, but added by degrees and with occasional stirrings. This being completed, the oil is again boiled briskly for about an hour, and then, the furnace being drawn, allowed to cool. When the temperature is sufficiently reduced, it is removed to leaden cisterns, where it is stored till fit for use.

Boiled Oil for Varnishes.—Mix 100 gallons linseed oil and 7 pounds calcined white vitriol (sulphate of zinc) in fine powder, in a clean copper-boiler; heat it to 285 degrees Fahr., and keep it at that temperature for at least an hour, constantly stirring it; then allow it to cool; in 24 hours decant the clear portion, and in 3 or 4 weeks rack it for use.

Ordinary Carriage Varnish.—Sorted gum anime, 8 pounds; clarified oil, 3 gallons; litharge, 5 ounces; dried and powdered sugar of lead and white copperas, of each 4 ounces; boil as last, and thin with oil of turpentine, 5½ gallons.

Oil Copal Varnish.—Pale hard copal, 2 pounds; fuse, add hot drying oil, 1 pint; boil as before directed, and thin with oil of turpentine, 3 pints, more or less, as found necessary. Very pale. Dries hard in 12 to 24 hours.

Best Pale Carriage Varnish.—Pale African copal, 8 pounds; fuse, and add clarified linseed oil,

2½ gallons; boil till very stringy, then add dried copperas and litharge, of each ¼ pound; boil as before directed, thin with oil of turpentine 5½ gallons; mix while hot with the following varnish, and immediately strain the mixture into a covered vessel: Gum anime, 8 pounds; clarified linseed oil, 2½ gallons; dried sugar of lead and litharge, of each ¼ pound; boil as before, thin with oil of turpentine, 5½ gallons, and mix it while hot with the last varnish as above directed. Dries in 4 hours in summer and 6 in winter. Used for wheels, springs and carriage parts of coaches and other vehicles, and by house painters, decorators, etc., who want a strong, quick-drying and durable varnish.

Tin-Roof Painting.—To allow a new tin roof to become rusty before being painted is like closing up the bunghole of a barrel and letting the liquid flow from the spigot. A rough surface secures the paint better, but gives the tin a start toward rusting, and the rust will sooner or later destroy it. This is based on the fact, and proved by experience, that iron once started to rust will continue on to rust when water or dampness is present, until in time it is entirely destroyed, even though the best of paint is laid on to protect it.

In these days, when the lowest and most unscrupulous bidder usually receives the contract to build, the painter can hardly be blamed for "closing the bunghole" by means of cheap iron or ore paint, and allowing the tin, *that should be protected*, to waste through the spigot by rust. It is by far the better

way to repaint the roof when the paint is too much flaked off, then to permit the tin roof to rust. The main cause of paint flaking or peeling off tin is owing to the polished surface, as no polished metal will properly hold paint. This accounts for painters preferring a slightly rusted roof to work upon, because it fastens the paint better, although at the same time damages the tin. When iron ore paint hardens, it contracts, hardens and loses its hold on polished surfaces, which increases to an astonishing degree in cold weather, when the least vibration will loosen its hold.

WAXING FLOORS.—Melt a half pound of resin, in drying oil, then add one pound of beeswax, and when well mixed thin with turpentine. Apply it with a pad made of coarse flannel or felt, and polish with a hard brush and a soft rag.

IMPROVED PAPIER-MACHE PROCESS FOR PAPERING FLOORS.

A durable and inexpensive method of employing papier-mache as a substitute for mattings, carpets, oil cloths and other floor coverings has been introduced, the simplicity of the process being also an additional advantage in its favor. After the floor has been thoroughly cleaned, the holes and cracks are filled with paper putty, made by soaking a newspaper in a paste made of wheat flour, water and ground alum; that is, to one pound of such flour are added three quarts of water and a tablespoonful of ground alum, these being thoroughly mixed. With

this paste the floor uniformly, and upon this a thickness of manila or hardware paper is placed, or if two layers are desired, a second covering of paste is spread over the first layer of manila paper, and then the second thickness of paper is put on and the whole allowed to become perfectly dry; on this being accomplished, another surface of paste is added, succeeded by a layer of wall paper of any style or pattern desired. On the work becoming entirely dry, it is covered with two or more coats of sizing, made by dissolving one-half pound of white glue in two quarts of hot water and when this has dryed a coat of "hard oil finish varnish," nothing more being required after the latter has had time to become thoroughly dry in every part.

PERMANENT SIZE FOR KALSOMINE, &C.

Dissolve in 20 gallons of boiling water 3 lbs. SA, together with 1 lb. of BX; then add to it, stirring well at the time, 5 lbs. RN, having been previously mixed with 2 lbs. B, the whole kept boiling continually till the RN is dissolved. This composition dissolved in the proportion of 1 lb. to 30 lb. of water is to be mixed together with a G solution—made by dissolving 10 lbs. of G in 30 lbs. of SW—then boil both solutions together for about 10 minutes, then run through a strainer. The above will do for plastered walls that you intend to paint or kalsomine.

PERMANENT SIZE FOR WALL PAPER, OR WOOD THAT IS TO BE VARNISHED.

1 lb. white G, let soak 24 hours in enough SW to cover it, then add 2 gallons boiling SW, 1 pint WN. Mix well together. This can be relied upon to keep without souring. Common G will do for rough work. Common starch is a good size forwall paper; also corn starch for fine work.

WATERPROOF GLUE.

Take of gum sandarach and mastic and white turpentine, of each 1 oz., alcohol 1 pt. Dissolve the gums in the alcohol, using heat if necessary, then add the turpentine, and have ready a very thick glue, 1 pint, in which there has been added ½ oz. of isinglass dissolved. Make the alcoholic solution boiling hot by having it in a pan inside of a kettle, or another pan of water. then slowly add the hot glue, stirring constantly till thoroughly mixed. Strain through a cloth. It is to be applied hot. It dries quickly and becomes very hard and surfaces of wood united with it do not separate when immersed in water. This will do to size wood that is to be varnished, but will require thinning down when used for that purpose.

JAPANNING.

Coat the work with good clear black Japan and place it in an oven heated to 250 degrees. The oven must not have direct communication with the open fire, as the evaporation of the volatile spirits of

the varnish mixed with the air, makes an explosive compound. Use a furnace outside of the oven. Make the oven of brick or iron. If you have steam at 60 lbs. pressure, you can make a steam coil on the bottom of the oven to answer your purpose, and which is far safer. Small articles have been japanned with fair success by using an ordinary cook stove oven. If the goods are of a kind that will bear dipping, you can thin the turpentine. You will have to make a few experiments to get your japan and oven just right.

STEAM PIPES, Etc.

Coat with color desired ground in japan, thinned with good body varnish and TT, several thin coats. Use no oil.

SMOKE STACKS.

Coal tar put on while warm will do. But a better way is to make a paint with BO, LP and finely ground plumbago, which, if applied properly will keep its color fairly on heated iron work.

FRENCH POLISH.

The following are both French polishes:

1. SH, 3 lbs; WN, 3 pts. Dissolve.

2. SA 2 lbs.; powdered mastic and sandarac of each 1 oz.; copal varnish, ½ pint; spirits of wine, 1 gallon. Digest in the cold till dissolved.

OILED CLOTHING.

For a solution for making the yellow oiled clothing that teamsters wear instead of rubber coats and pants, dissolve 1 oz. of beeswax in 1 pint of the best boiled linseed oil over a gentle fire, applying when cold, with a piece of rag, rubbing it well in, and afterwards hanging up to dry, which will take about 3 days. Also for a solution for making aprons that are used in slaughter houses; they are soft and pliable, black on one side and show the canvas color on other side, but will not let the water soak through. Let 4 oz. India rubber in pieces be softened in 8 oz. oil of turpentine, then add 2 lb. of boiled oil, and boil for two hours over a slow fire. When dissolved, add 6 lb. boiled linseed oil and 1 lb. of litharge, and boil until an even liquid is obtained. Apply warm.

CONTRACTING.

There are times that the painter cannot go all through a house and measure everything in it that is to be painted. I have made bids on work inside of ten minutes, never having seen the innerior. The method I have is to average all inside work thus: 1 side of door and frame, 1 side of window and frame, 1 base board, 1 mantle. If they are all meas-

ured up, the average will be five yards apiece, at 20 cents per yard would be $1.00 Count the number of sides and multiply by $1.00 and you will have the cost of all work.

MEASUREMENTS.

OUTSIDE WORK.—To get at the number of yards there are of wall or weatherboard, I would suggest the following method: Add the number of feet front and rear to the feet in length (both sides). Multiply this by the average height. Divide the product by 9, which will give the number of yards to be painted.

For Example—Front.....30 feet
Rear .....30 "
Side.....40 "
Side.....40 "

140
Multiply by average height..... 25

700
280

9)3500

Square yards..... 389

In some sections it is not customary to count in windows and doors solid. The painter should have extra for all outside doors and windows. Windows will average three yards; doors and casings five yards. If you think you can do the work for 20 cts. per yard, the windows would be 60 cents apiece,

then multiply by the number of windows. The door should be $1, which also multiply by the number of doors.

Cornices should be measured 1 1-2 times for the girth if it is plain and one color, but if more than one color, one girth for each additional color. The measurer must make allowance for the position of the cornice, if it is a hard one to get at, allow for it accordingly.

Cornice with blocks—two girths.

" " " and brackets—if the brackets are not very close together, give it two and a half girths.

Cornice with blocks, brackets and molded panels —3 girths.

Barge boards, if 6 inches wide, should count one foot.

Corner strips, carpets strips, hook strips, gas and others pipes, should count as one foot.

Blinds, the height, one time, width, three times.

Lattice, height one time, width four times.

Scroll wrok on verandas should be measured solid for each side.

Sash solid for each side.

Cutting edges of all descriptions inside and out, four inches.

Cupalos and other high work should have double measurement.

Weatherboard edges should be counted as 1 inch.

Base board from 5 to 8 inches should count as one foot.

Capped base, one and one-half feet, with two colors if 10 inches, 2 feet; if over 10 inches, more in proportion.

Fencing should be counted solid on both sides.

Picket fence, 4 feet high, one yard to foot.

Iron fence, 3 feet high, one yard to foot.

BILLS OF PRICES FOR PAINTING, &c.

NEW WORK AND FURNISH MATERIAL.

Surface work, square yards, 1 coat,.....10c
Surface work, square yards, 2 coats,.....18c
Surface work, square yards, 3 coats,.....25c
Brick walls, square yards, 1 coat,.....15c
Brick walls, square yards, 2 coats,.....25c
Brick walls. square yards, 3 coats,.....35c

Varnishing same as painting.

OLD WORK.

Surface work, square yards, 2 coats,.....18c
Brick wall, square yards, 2 coats,.....20c
Brick wall, penciling, square yard,.....10c
Ground graining, and one coat of varnish, square yard.....60c
Graining,.....35c

GLAZING.

Priming and glazing sash, glass 10 inches in length,..... 5c

Add 1 cent for each two inches up to 24, after which add 1 cent for one inch. Bedding and back-puttying charge double rates. When putty is of a different color, charge in proportion to the extra labor, which is generally one half more. If the painter furnishes the glass, charge 10 per cent. of cost of breakage.

RE-GLAZING.

Charge same for the labor that the glass costs.

LETTERING.

Plain letters on board, per foot 20c
Shaded, one color, on board, per foot.....25c
For each additional color, per foot 5c
Plain lettering on muslin, per foot.....10c
Plain lettering on wall, per foot..... .....18c
Large lettering on wall, per foot.....25c

Charge for the ground by the square yard.

Gold lettering on board, small, per foot.....50c
" " " over 6 in. " 60c
" flock or smalt " 75c
" on glass, small " 60c
" " large " 75c
" " shade 1 " 80c
" " blend shade, ...$1.00 to $1.25
Gilding per book..... .....50c

A book of gold has 25 leaves in it, 3½ inches square or 12¼ inches or 308 inches to the book. A good gilder will make it reach 310 on flat work; sign work 300; there being so much more waste in

that class of work. It is always best to count the leaf 9 inches and allow the ½ inch for waste.

1 paper of bronze will go over 4 square feet.

1 pound of flock will cover 5 yards.

1 pound of smalt will cover 1 yard.

CARRIAGE PAINTING.

New buggy, plain finish..... .....$15 00
New buggy, fine finish..... $18 00 to $25 00
New carriage, plain finish.....$20 00
New carriage, fine finish.....$25 00 to $35 00
Spring wagon, new, plain finish.....$12 00
Spring wagon, new, fine finish.....$15 00 to $25 00

For old work, one fourth less than new.

WEIGHTS AND MEASURES OF PAINTS.

The figures here given are the results of careful experiments, and will prove as nearly right as it is possible to make them.

WEIGHTS.—Turpentine,	1 gal.,	weight,	5 lbs.
Varnish	"	"	8 lbs.
Linseed oil	"	"	7½ lbs.
Japan	"	"	9 lbs.
Pure Lead Mixed	"	"	20 lbs.

PRIMING WOODWORK.

1 lb. of pure lead will prime.....4 sq. yds.
1 lb. adulterated lead " .....5½ "
1 lb. substitute lead " ....8 "
1 lb. ochre will prime.....7 "

PRIMING BRICK WALL.

1¼ lb. lead will prime..... ....1 sq. yd.

The other paints the same in proportion.

On plastered walls you can calculate on the material going 1¾ times as far as on wood work and if the walls are hard finish it will go still farther. 5 lbs. substitute will finish a ceiling 15x15, giving it three coats and you will have a much better job than if you use lead.

PAINTERS COLIC.

MEDICAL.

Iodide of Potassium, one-half ounce.

Syrup of Sarsaparilla, six ounces.

Mix and take one teaspoonful four times a day.

The above recipe is one used by the entire profession, as a cure for lead poisoning, and is considered the best in use by the most eminent authors. It is a well known fact that lead poisoning is exceedingly hard to control, from two reasons. First, it is most insidious in its approach, and has thoroughly pervaded the system before the unfortunate victim is aware of its existence; and secondly it is like the chains of malaria, the victim must either give up his trade or be constantly exposed to the cause of his malady.

For the prevention of the poison, I would recommend first of all, cleanliness in every particular; regular baths in cold water; the avoidance of too constant wearing of the clothes saturated with white lead; the working in close shops. A close attention should be paid the diet, the bowels kept regular, and open air exercise should be constantly observed. A painter who makes his trade a life-work should leave his shop at intervals, not too far apart, and remain away from the poison long enough each time for his system to free itself from any invasion that has already been made, and I feel quite sure that if the above observations be strictly followed, there will be no "painter's colic."

KEY.

Be careful of the Key, and try to become familiar with it; and if at any time the Key is lost, and you wish another, send 10 cents to my address and you will receive one.

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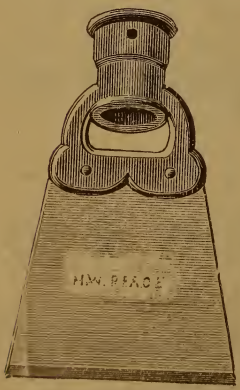

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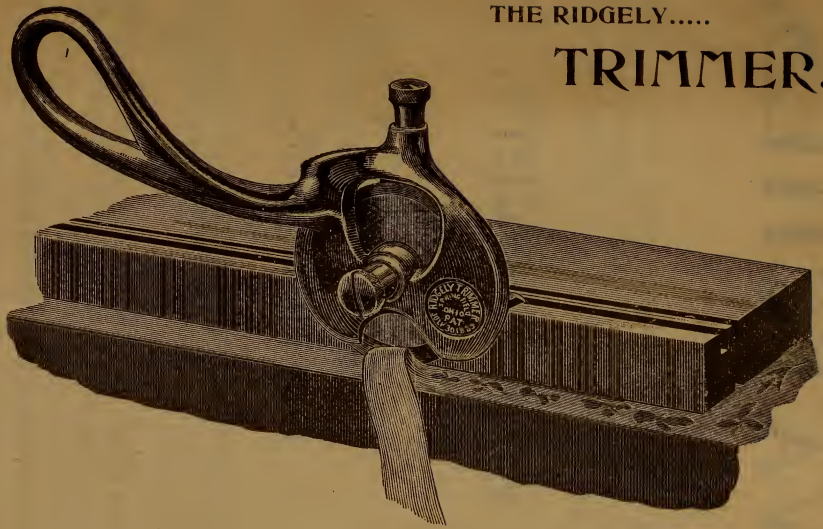

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